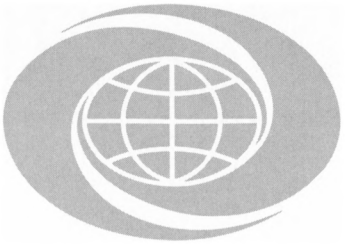

The World Book Encyclopedia

U-V Volume 20

Field Enterprises Educational Corporation

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The World Book Encyclopedia

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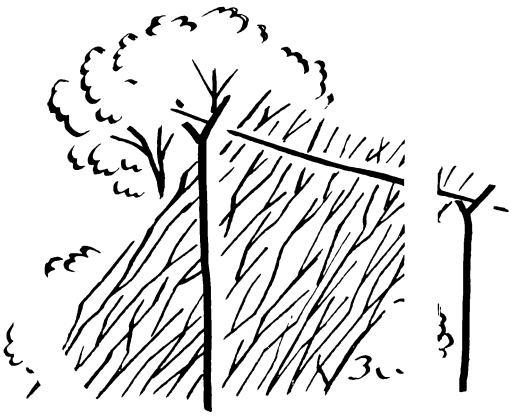
Uu

is the 21st letter of our alphabet. It came from a letter which the Semitic peoples of Syria and Palestine called *waw*. *Waw* was also the source of *F*, *V*, *W*, and *Y*. The word *waw* meant hook, and was represented by a symbol of a tenthook. The symbol was probably borrowed from an Egyptian hieroglyphic, or picture symbol. The Greeks borrowed the letter from the Phoenicians and gave it a *Y*-shape. The Romans, when they adopted the letter, dropped its bottom stroke and wrote it as *V*. They used it for the vowel sound, *U*, and the consonant sound, *V*. About A.D. 900, people began to write *U* in the middle of a word and *V* at the beginning. During the Renaissance, it became customary to use *u* as a vowel and *v* as a consonant. See ALPHABET.

Uses. *U* or *u* is about the 12th most frequently used letter in books, newspapers, and other printed material in English. As an abbreviation on report cards, *u* means *unsatisfactory*. In geographic names, it may mean *united*, *union*, or *upper*. It frequently stands for *university*. In chemistry, *U* is the symbol for the element *uranium*.

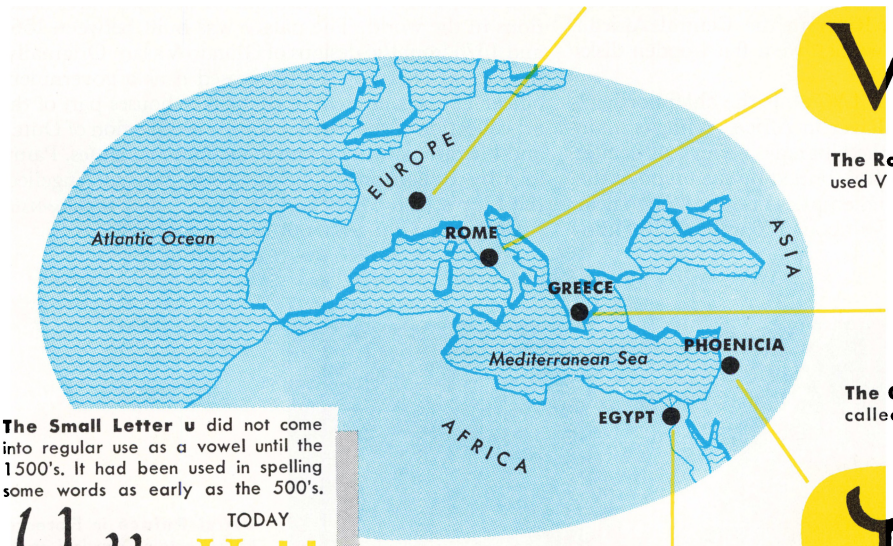
Pronunciation. *U* is a vowel, and has many sounds in English. The sound we associate with its name, *you*, is really a diphthong. It is made by linking two separate sounds pronounced continuously. A person forms this sound by rounding his lips, with the tip of his tongue below the lower teeth, and raising the back of his tongue. Other sounds of *u* are those in *sun*, *duty*, *presume*, *bull*, and *fur*. A silent *u* may occur after *g*, as in *guard* and *guess*. See PRONUNCIATION. I. J. GELB and JAMES M. WELLS



The 21st letter took its shape from an ancient Egyptian symbol for a supporting pole. It was not regularly used for our vowel sound, *you*, until about 500 years ago.

U

Medieval Scholars began writing U for a vowel sound and V for a consonant.



The Small Letter u did not come into regular use as a vowel until the 1500's. It had been used in spelling some words as early as the 500's.

V

The Romans, about A.D. 114, used V for both U and V sounds.

Υ

The Greeks, about 600 B.C., called their letter *upsilon*.

Y

The Phoenicians, about 1000 B.C., used a symbol of a hook.

Y

The Egyptians, about 3000 B.C., used a symbol of a supporting pole.

U-BOAT. See SUBMARINE (During World War I); WORLD WAR II (U-Boats).

U THANT. See THANT, U.

U-2, reconnaissance plane. See COLD WAR (The U-2 Incident; picture: A U.S. Spy Plane).

U-235 is a radioactive isotope of uranium. *Isotopes* are atoms of an element that have different weights from other atoms of the element (see ISOTOPE). The naturally occurring isotopes of uranium, U-235, U-234, and U-238, have mass numbers of 235, 234, and 238. U-235 makes up less than 1 per cent of natural uranium. U-234 and U-238 compose the rest.

Of the three natural uranium isotopes, U-235 undergoes *fission* (atom splitting) most easily. During fission atoms of new elements are formed. U-235 may break down into approximately 30 other elements called fission products. When U-235 atoms split, an enormous amount of energy is produced. The fission of one pound or kilogram of U-235 produces as much energy as the burning of 2,300,000 times the same amount of coal. For this reason, U-235 is used as a fuel for producing nuclear energy in nuclear reactors. Purified U-235 is also used as fuel in atomic bombs. The atomic bomb dropped on Hiroshima, Japan, in 1945, during World War II contained U-235. See ATOMIC BOMB (picture: The "Little Boy").

Arthur J. Dempster, an American physicist, first identified U-235 in 1935 at the University of Chicago. U-235 has the atomic number 92. It melts at 1132.3° C and boils at 3818° C. FRANK C. ANDREWS

See also DEMPSTER, ARTHUR J.; NUCLEAR ENERGY; URANIUM.

U-238 and **U-239.** See URANIUM; NUCLEAR ENERGY.

U.A.R. See UNITED ARAB REPUBLIC.

UBANGI, *yoo BANG ee,* is a nickname given to women members of the Sara, an African Negro tribe living near the Ubangi River in the Central African Republic. Many of the women wear flat wooden disks in their pierced lips.

UBANGI RIVER, *yoo BANG ee,* is the chief northern tributary of the Congo River in Africa. With its main headstream, the Bomu, the Ubangi is about 1,400 miles (2,250 kilometers) long. It is formed by the union of the Bomu and Uele rivers, and empties into the Congo near Lake Tumba in Zaire. For about 700 miles (1,100 kilometers), the Ubangi forms the boundary line separating Zaire from Congo on the west, and Central African Republic on the northwest. The Ubangi is navigable the year around below Bangui, Central African Republic. WILLIAM A. HANCE

UCAYALI RIVER. See AMAZON RIVER (Its Course).

UCCELLO, *oot CHEL loh,* **PAOLO** (1397-1475), was one of the first Renaissance painters in Italy. Perspective takes on special emphasis in his work. Its purpose is to bring order into the host of things that people see. Uccello kept it from looking fixed and dead by his bright, almost flat color, and vivid movement. His best-known works include *The Flood* and three scenes of battles. A detail of *The Battle of San Romano* appears in color in the PAINTING article. Uccello lived in Florence, and was an apprentice to the sculptor Lorenzo Ghiberti. Uccello's real name was Paolo di Dono. CREIGHTON GILBERT

See also PAINTING (Florentine Masters).

UDALL is the name of two brothers, both Democrats, who held prominent posts in the United States government. Both were born in St. Johns, Ariz.

Stewart Lee Udall (1920-) was secretary of the interior from 1961 to 1969, under Presidents John F. Kennedy and Lyndon B. Johnson. Before his appointment, he served six years in the United States House of Representatives. During World War II (1939-1945), Udall served in the Army Air Forces. He received a law degree from the University of Arizona in 1948. Udall practiced law in Tucson until he won election to Congress in 1954.

Morris King Udall (1922-) succeeded his brother in the U.S. House of Representatives after a special election held in 1961. In 1974, he became the first Democrat to seek the presidential nomination for the 1976 election. ERIC SEVAREID

UDT. See UNDERWATER DEMOLITION TEAM.

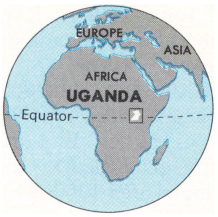
UFFIZI PALACE, *oof FEET see,* is a famous palace in Florence, Italy. It contains one of the finest art collections in the world. The palace was built between 1560 and 1576 from the designs of Giorgio Vasari. Originally, the Grand Dukes of Tuscany used it as a government office. The second floor of the palace houses part of the art collection of the Medici family, a collection of Dutch and Flemish paintings, and many famous statues. Paintings by Italian artists include some by Fra Angelico, the Lippis, and Michelangelo. SIBYL MOHOLY-NAGY

UFO. See UNIDENTIFIED FLYING OBJECT.

Alinari

Uffizi Palace in Florence, Italy, contains classical sculptures and masterpieces of Italian painting from all periods. The palace itself dates from the late 1500's.

UGANDA



Capital
Other City or Town
Road
Rail Line
MOUNTAIN
River

WORLD BOOK map

UGANDA is a thickly populated country in east-central Africa. Slightly smaller than Oregon, it has more than five times as many people as that state. Uganda has a pleasant climate and fertile soil.

The Africans in Uganda belong to several racial groups that differ more from one another than do the people of the various countries in Europe. English is the official language in Uganda, but the people speak many tribal languages. English and several tribal languages are used for broadcasting in Uganda.

The country's magnificent scenery includes snow-capped mountains, thick tropical forests, and semi-desert areas. Lakes cover more than a sixth of Uganda. Part of Lake Victoria, the world's second largest fresh-water lake, lies in the country. Many wild animals roam the vast national parks.

For almost 70 years, Great Britain governed the territory as the *Uganda Protectorate*. Uganda won independence in 1962 and became a republic in 1967. Kampala, the capital and largest city, has about 330,000 people.

Government. The Constitution of 1967 provides that Uganda's legislature, the National Assembly, shall elect the president for a five-year term. The president is head of state, head of government, and commander in chief of the armed forces. He appoints a vice-president and a Cabinet to assist him. The Constitution also provides for a Parliament, which consists of the president and the National Assembly. In 1971, parts of the 1967 Constitution were suspended after the Uganda Army overthrew the government. A military leader then ruled with the assistance of a Cabinet.

People. Most Ugandans are Negro Africans. Nearly all of the more than 20 tribal groups have their own language. Uganda has no language that is understood by everyone. The Baganda, the largest and wealthiest tribe, live in central and southern Uganda. Their political and social organization is one of the most highly developed in central Africa. Until 1967, the Baganda had their own *kabaka* (king) and their own *lukiko* (parliament).

Many Baganda are prosperous farmers. Coffee, cot-

Harold Ingrams, the contributor of this article, is a former British Colonial Service administrator and author of several books, including Uganda, A Crisis of Nationhood.

FACTS IN BRIEF

Capital: Kampala.

Official Language: English.

Form of Government: Republic.

Area: 91,134 sq. mi. (236,036 km²).

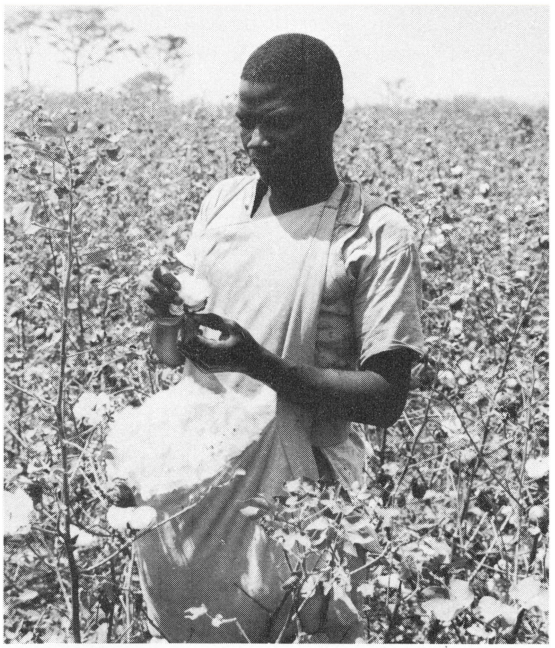
Population: *Estimated 1976 Population*—11,684,000; distribution, 88 per cent rural, 12 per cent urban; density, 129 persons per sq. mi. (50 per km²). *1969 Census*—9,548,847. *Estimated 1981 Population*—13,414,000.

Chief Products: *Agriculture*—bananas, cassava, coffee, cotton, sweet potatoes, tea, tobacco. *Mining*—copper.

Flag: A white-crested crane is centered on horizontal stripes of black (for Africa), yellow (sunshine), and red (brotherhood). See FLAG (picture: Flags of Africa).

Money: *Basic Unit*—shilling. See MONEY (table: Values).

A Cotton Field in Uganda produces one of the nation's most valuable crops. Cotton and coffee are the leading exports.
Authenticated News Int.



ton, and tea are the chief cash crops. Food crops include bananas and vegetables. Women do much of the work on the farms. The Baganda live in houses that have mud walls and corrugated iron roofs.

Like the Baganda, three other tribes in southern Uganda had their own kabakas until 1967. Most of the people are farmers. But the Karamojong in the northeast and several other tribes in the drier parts of the north lead wandering lives as herders. Karamojong men mat their hair with colored clay in elaborate patterns. A favorite meal consists of milk mixed with ox blood.

Most Ugandans practice tribal religions. About a fourth of the people are Christians, and there are also many Moslems. Most of the older people cannot read or write. Three-fourths of the children now receive elementary education. Makerere University is in Kampala.

Land. Most of Uganda is a plateau about 4,000 feet (1,200 meters) above sea level. Thick forests grow in the south. Most of the north is *savanna* (grassland with low trees), but some northeastern areas are semidesert.

Highlands rise near the east and west borders. In the east, Mount Elgon towers 14,178 feet (4,321 meters). Margherita Peak rises 16,763 feet (5,109 meters) in the Ruwenzori Range in the southwest. The Great Rift Valley borders the western highlands and contains Lakes Albert, Edward, and George. The headwaters of the White Nile drain Uganda (see NILE RIVER).

The equator runs through southern Uganda. But because of the high altitude, temperatures are mild. In most areas, the temperature seldom goes above 85° F. (29° C) at midday, or below 60° F. (16° C) at night. Most of Uganda receives over 40 inches (100 centimeters) of rain a year.

Economy. Uganda is an agricultural country. Coffee, cotton, and tobacco are the chief exports. The country has rich deposits of many minerals, but only copper is mined on a large scale. The Owen Falls Dam at Jinja, Uganda's main industrial town, has one of Africa's largest hydroelectric power stations.

Copper ore goes from the mines at Kilembe, near Kasese, to a smelter at Jinja, and then to Kampala and the Kenya seaport of Mombasa. Most exports pass through Mombasa. Cargo and passenger ships operate on Lakes Albert, Kyoga, and Victoria, and on the Albert Nile. Uganda has about 3,800 miles (6,120 kilometers) of roads.

Kampala, the Capital of Uganda, is a mixture of the old and new. Many of the women wear colorful ankle-length dresses.
Marc and Evelyne Bernheim, Rapho Guillumette

History. By the 700's and 800's, the people in parts of what is now Uganda had developed agriculture and the use of iron. By 1200, they had a simple form of government headed by chiefs. Several local kingdoms developed after 1300. The most important early kingdoms were Kitara and Bunyoro.

Arab traders came to the area about 1850. By that time, the Baganda tribe had formed the richest and most powerful kingdom, called Buganda. This kingdom had a large army and a highly developed system of government. Explorers and missionaries from Great Britain arrived in Uganda during the 1860's and 1870's. Great Britain made Buganda a British protectorate in 1894. Buganda and three other kingdoms united and became a British protectorate later in the 1890's. Uganda attained its present boundaries in 1926. The British gradually developed the country's economy. After World War II, Africans played an increasingly important part in governing Uganda. Many Baganda wanted their kingdom to become independent. This caused trouble in the 1950's between the kabaka of Buganda and the British. On Oct. 9, 1962, Uganda became independent. Apollo Milton Obote, a member of a northern tribe, became prime minister. Buganda got special powers and was more independent of the central government than the other kingdoms.

In October, 1963, a kabaka was elected president. But serious differences arose between the kabaka and Obote over a land dispute between the Baganda and Bunyoro tribes. In 1966, Obote charged that the kabaka was plotting to overthrow the government. He dismissed the kabaka and announced a new constitution that made him president. The constitution also abolished the four kingdoms in Uganda. The kabaka fled when government troops attacked his palace.

In 1967, Uganda became a republic. Also, Uganda, Kenya, and Tanzania formed the East African Community to regulate trade and promote economic growth.

In December, 1969, an assassin failed in an attempt to kill Obote. The Uganda Army overthrew Obote in 1971, and set up a military government. Major General Idi Amin Dada, commander of the country's armed forces, headed the new government.

In 1972, President Amin ordered about 47,000 Asians who had been living in Uganda to leave the country. These Asians had not become Ugandan citizens, but they owned many of the country's businesses. By expelling them, Amin hoped to gain more control of the economy for Ugandans. HAROLD INGRAMS

Related Articles in WORLD BOOK include:

Coffee (graph)	Family (A Tug of War)	Lake Victoria
Entebbe	Kampala	Nile River
Exploration and Discovery	Lake Albert	Ruwenzori Range
	Lake Edward	

UHF WAVE. See ULTRAHIGH FREQUENCY WAVE.
UIGUR. See TURKESTAN.
UINTA. See UTAH (Land Regions).
UINTAITE. See ASPHALT.
UITLANDER. See BOER WAR.

UKRAINE

The Ukraine is one of the 15 republics of the U.S.S.R. It is a major farming, industrial, and mining area.

⊛ Republic capital — Republic boundary
• Other city or town — Road — Rail line

WORLD BOOK map

UKRAINE, *yoo KRAYN,* is a rich farming, industrial, and mining region in southeastern Europe. It makes up the Ukrainian Soviet Socialist Republic (Ukrainian S.S.R.), one of the 15 republics of the Soviet Union. The Ukraine covers about 233,090 square miles (603,700 square kilometers) and has a population of about 47,496,000. About half the people live in urban areas. Kiev is the capital and largest city.

People. About three-fourths of the people of the Ukraine are Ukrainians, a Slavic nationality group that has its own customs and language. Russians, a separate group that speaks the Russian language, make up nearly a fifth of the population. About 2 per cent of the people are Jews, whom the Soviet government also considers a separate nationality group. The Jewish population was sharply reduced during World War II (1939-1945), when the Nazis killed thousands of Ukrainian Jews. Most of the Russians and Jews live in cities.

Many urban Ukrainians speak Russian most of the time. In rural areas, nearly all the people speak Ukrainian. Each region of the Ukraine has its own *dialect* (local form of a language). But the schools teach a standardized form. The universities of Kiev, Lvov, and Odessa rank among the oldest and most famous in the Soviet Union. The Ukraine also has five other universities.

Rural Ukrainians are known for their strong ties to their families and farms. Villagers build their homes and barns of whitewashed stone or adobe, with thatched roofs. Peasant costumes worn on holidays feature white blouses or shirts, decorated with colorful embroidery. Ukrainians enjoy music, and many of them perform in choruses and dance groups. Ukrainian music often features a stringed instrument called a *bandura.*

Land and Climate. The Ukraine consists largely of a flat plain that stretches from the Pripyat Marshes in the north to the Black Sea in the south. The Carpathian Mountains border the Ukraine on the west. Major rivers include the Dnepr, the Dnestr, and the Donets.

Most parts of the Ukraine have cold winters and hot summers. Temperatures average 23° F. (−5° C) in January and 70° F. (21° C) in July. *Precipitation* (rain, snow, and other measurable forms of moisture) ranges from about 30 inches (76 centimeters) a year in the north to about 9 inches (23 centimeters) in the south.

Economy. Ukrainian farms produce more than half the Soviet Union's sugar beets, nearly a fourth of its meat and dairy products, and a fifth of its grain. Wheat ranks as the main crop in the south. Ukrainian farmers also raise barley, corn, rye, tobacco, and other crops.

The Ukraine has rich deposits of coal, iron ore, manganese, mercury, natural gas, and salt. Heavy industries have developed around these mineral deposits, especially near the cities of Donetsk, Dnepropetrovsk, and Kharkov. About two-fifths of the steel and nearly a third of the coal produced in the Soviet Union comes from the Ukraine. Major manufactured goods include agricultural machinery, cement, chemicals, fertilizer, food products, locomotives, ships, and trucks.

History. During the A.D. 800's, a Slavic civilization called Rus grew up at Kiev and at other points along the river transportation routes from the Baltic Sea to the Black Sea. In time, Kiev became the first of the independent Russian city-states.

During the 1200's, Mongol tribes later known as Tartars swept across the Ukrainian plains from the east and conquered the region. Beginning in the early 1300's, Lithuania and Poland gradually took control of the Ukraine. Under Polish-Lithuanian rule, Ukrainian peasants were bound to the land as serfs. During the

V. Runov, Sovfoto

Ukrainian Women embroider colorful designs on blouses, scarves, pillowcases, tablecloths, and other items. Such embroidery is a distinctive feature of traditional Ukrainian clothing.

M. Barabanov, Sovfoto

Kiev is the capital and largest city of the Ukraine. Tree-lined downtown boulevards, such as Kreshchatik Street, above, help make Kiev one of the Soviet Union's most picturesque cities.

1400's, many discontented peasants joined bands of independent soldiers called *Cossacks* (see COSSACK). The Cossacks occupied the territory that lay between the Poles and the Tartars. The region became known as the *Ukraine*, which is a Slavic word meaning *borderland*.

Most of the Ukraine remained under Polish rule until the 1600's. The Cossacks opposed Polish efforts to make them leave the Eastern Orthodox Church and join the Roman Catholic Church. In 1654, this dispute led the Cossack leader Bohdan Khmelnytsky to form an alliance with the Eastern Orthodox *czar* (king) of Russia.

By the mid-1700's, Russia had gained control over almost all the Ukraine. Under Russian rule, the Ukrainians could practice their religion freely, but they remained serfs. Many of them objected to this harsh way of life and to Russia's efforts to replace the Ukrainian language with Russian. Beginning in the mid-1800's, the poet Taras Shevchenko led a revival of Ukrainian culture. The historian Michael Hrushevsky wrote many books on Ukrainian history that stressed the Ukraine's complete separateness from Russia.

In 1917, the Bolshevik Revolution led to the establishment of a Communist government in Russia. After the revolution, many Ukrainians tried to form an independent Ukrainian state. But in time, the Communists brought most of the Ukraine under Communist rule as the Ukrainian Soviet Socialist Republic. In 1922, the Ukraine became one of the four original republics of the Union of Soviet Socialist Republics.

In the Ukraine, as in other parts of the Soviet Union, the Communist government severely limited cultural and political activity. In 1929, the government began to take control of small peasant farms. Hundreds of thousands of Ukrainians were sent to Siberia and Soviet Central Asia for resisting the government take-overs. During the 1930's, crop failures and government seizures of grain resulted in millions of deaths from starvation.

After World War II ended in 1945, the Soviet Union took over parts of the Ukraine that had belonged to Czechoslovakia and Poland. The Crimean Peninsula became part of the Ukrainian S.S.R. in 1954.

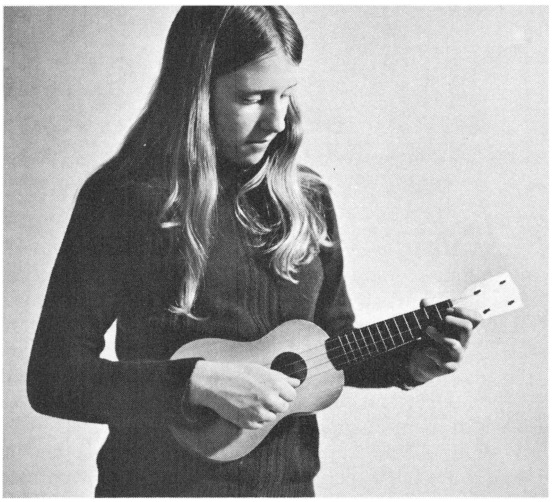
Since 1950, the economy of the Ukraine has grown rapidly, and standards of living have risen. But during the 1960's and early 1970's, many Ukrainians continued to oppose Russian domination and government limits on cultural freedom. JOHN A. ARMSTRONG

Related Articles in WORLD BOOK include:

Black Sea	Dnestr River	Mazepa, Ivan S.
Christmas	Donetsk	Odessa
(color picture)	Easter	Russia
Crimea	(In the Ukraine)	Ruthenia
Dnepr River	Kharkov	Sevastopol
Dneproges Dam	Kiev	Shevchenko, Taras
Dnepropetrovsk	Lvov	Yalta

UKRAINIAN SOVIET SOCIALIST REPUBLIC. See UKRAINE.

UKULELE, *YOO kuh LAY lee* or *OO ku LAY lay*, is a four-stringed musical instrument which was first played in Hawaii. It is patterned after the Portuguese *taropatch fiddle*. The strings are tuned to A, E, C, and G, or to



Jim Collins

The Ukulele looks somewhat like a small guitar. It is played by strumming the four strings with the fingers.

related pitches. The player *strums* (brushes) the strings with a sweeping motion, and always plays chords. Ukulele music is usually written in chord symbols which indicate finger positions, rather than in notes. The player need not know how to read music. See also HAWAII (Dancing). CHARLES B. RIGHTER

ULAN BATOR, *OO lahn BAH tohr* (pop. 267,400), is the capital of Outer Mongolia. For location, see MONGOLIA (map). Its industries produce woolen cloth, felt, saddles, shoes, and meat products. Ulan Bator is a rail center and has a university. Founded in 1649, it has also been called *Urga*.

ULBRICHT, *OOL bright*, **WALTER** (1893-1973), was the Communist leader of East Germany from 1950 to 1971. He ruled the country as general secretary of the Communist-dominated Socialist Unity Party. In 1961, Ul-

bricht ordered the building of the Berlin Wall, which separated the eastern and western sectors of the city.

Ulbricht was born in Leipzig, Germany. He helped found the German Communist Party in 1919, and studied Communist theory in Russia in the mid-1920's. He was exiled from Germany from 1933 to 1945. He served with Communist forces in Spain during the Spanish Civil War. He returned to Germany in 1945, and helped form the Socialist Unity Party. Ulbricht was deputy premier of East Germany from 1949 to 1960. GEORGE G. WINDELL

ULCER, *UL ser*, is an open sore in the skin or mucous membrane. A section of the covering membrane, the *epithelium*, breaks down and dies, leaving a raw area that heals slowly. A wound is not an ulcer.

Ulcers are likely to form on some part of the body which has poor blood circulation. Even a small injury on that part may lead to ulceration. The condition is common on legs with varicose veins. It is important to heal ulcers of the lips or skin, in order to prevent other conditions such as cancer from occurring.

Many persons have *peptic ulcers* (ulcers in the lining structure) in the stomach. Even more have peptic ulcers in the duodenum, the part of the intestine immediately below the stomach. Some of the causes or conditions that may lead to ulcers include heredity, nervous strain, poor circulation, or bad diet. But too much gastric juice is considered the real cause of stomach ulcers. Excess acid in the stomach keeps the ulcer from healing and helps keep it chronic. Ulcers of this kind usually cause pain or distress in the pit of the stomach. They may sometimes bleed, and are most dangerous when they *perforate* (eat through) the organ. This may lead to peritonitis. Stomach ulcers are treated with alkaline drugs and careful diet. Some ulcers require surgery.

Ulcers on the eyeball are dangerous. When a tooth ulcerates, an ulcer may form on the gum when pus has gathered around the root.

See also CANCER; CANKER; STOMACH; TYPHOID FEVER.

ULEMA. See SAUDI ARABIA (National Government).

ULITHI, *oo LEE thee*, atoll is one of the western Caroline Islands. It consists of a large atoll, with 183 square miles (474 square kilometers) of lagoon and some detached reefs and islets. The land area totals less than 2 square miles (5 square kilometers). About 1,700 Micronesians live on the islets. They raise food for their own use and make copra for trade. Like the other Caroline Islands, Ulithi is part of the Trust Territory of the Pacific Islands. The U.S. administers Ulithi. See PACIFIC ISLANDS, TRUST TERRITORY OF THE; PACIFIC ISLANDS (color map). EDWIN H. BRYAN, JR.

ULNA. See ARM.

ULNAR NERVE. See FUNNY BONE.

ULSTER, *UL ster*, was one of the five provinces of early Ireland. It included what is now Northern Ireland, as well as the counties of Cavan, Donegal, and Monaghan. Northern Ireland is often called Ulster. For location, see IRELAND (color map). See also NORTHERN IRELAND.

ULTIMA THULE, *UL tih muh THYOO lee*, was the name given in ancient literature to the most northern of known lands. A Greek sailor named Pytheas spoke of it in the 300's B.C. He said that the days and nights in Ultima Thule lasted for six months, and that the sea there was so thick the rowers could not get through it. Some think that Pytheas was referring to Norway or Iceland. Others believe Ultima Thule was one of the Shetland Islands. Today Ultima Thule is used to mean any distant place or faraway goal. THOMAS W. AFRICA

ULTIMATUM, *UL tuh MAY tum*, is a final proposition or demand made by one of two negotiating parties. The term is usually used in international affairs. It is a forceful and definite statement of one country's position. It often includes a demand for certain action on the part of the other country within a time limit. The rejection of an ultimatum may mean that one nation breaks off peaceful negotiations with the other. PAYSON S. WILD

ULTRAFAX is a method for copying and sending printed or written material and photographs by electrical means. A machine, known as the *scanning head*, is moved over small areas of the material that is to be sent. The machine copies the material and changes it into electric waves which can be sent over telephone wires or broadcast by radio to receiving points. At the receiving stations, machines called *recorders* receive the electric waves and reproduce copies of the material originally scanned.

See also MICROWAVE.

ULTRAHIGH FREQUENCY WAVE is a very short radio wave, from 0.1 to 1 meter long. UHF waves range from 300 million to 3 billion *hertz* (cycles per second). In the radio spectrum the ultrahigh frequency waves come between *very high* frequency waves and *super high* or microwaves. All of these high frequency waves have certain characteristics that make them different from standard broadcast waves, which have a lower frequency and a longer wave length. UHF waves, when sent from reflectors or directional antennas, are transmitted in a narrow path and travel in a straight line. UHF waves can also be reflected, like light waves.

UHF waves, very high frequency waves, and microwaves have been developed to their greatest usefulness in television, radar, "proximity fuses," guided missiles, and radio aircraft equipment. These frequencies are far above the ordinary broadcast band, and can therefore be used without interference. They are similar to light in that they can be projected into a beam in any direction desired. Their reflection from objects allows their use in radar to locate and "track" enemy aircraft and ships. PALMER H. CRAIG

See also MICROWAVE; RADAR; TELEVISION (Broadcasting).

ULTRAMARINE, *UL truh muh REEN*, is a blue pigment or coloring matter now prepared by artificial means. It usually has a purplish or greenish tinge. Ultramarine is made by *calcining* (heating) various combinations of China clay, sodium carbonate, silica, carbon, and sulfur until they form a dry powder. Ultramarine was once ground from the rare mineral lapis lazuli. This old method produced a brilliant, durable blue color, which was much prized by artists, but was very expensive. See also LAPIS LAZULI. THOMAS MUNRO

ULTRAMICROSCOPE is an instrument that allows a person to see objects that are much smaller than those he can see under an ordinary microscope. It is a compound microscope with several lenses. But it differs from other compound microscopes, because it uses a strong horizontal beam of light to illuminate the particles to be seen. This light beam can be brought into

intense focus. Usually a powerful arc lamp supplies the light. The rays of light are focused by means of a system of condensing lenses. The last lens brings the rays together into very small, intensely brilliant focus.

Scientists often use this microscope to study *colloidal particles*, or bacteria floating in liquid or in the air. They set the microscope so that it receives only the light scattered by the particles themselves. No part of the direct light that illuminates the objects can enter the instrument. Therefore, the particles shine out as bright "stars" against a dark background. However, like the stars in the sky, these particles appear as points of light without structural detail. Objects as small as $\frac{6}{1,000,000}$ of a millimeter can be seen with an ultramicroscope. JOSEPH VALASEK

See also ELECTRON MICROSCOPE; ION MICROSCOPE.

ULTRASOUND is a sound that is too high-pitched to be heard by human beings. The pitch of a sound is called its *frequency*, the number of sound waves produced per second. The higher the frequency, the higher the pitch of the sound produced. Most people can hear sounds of frequencies between about 20 and 20,000 vibrations per second. Ultrasound has more than 20,000 vibrations per second.

Scientists use a device called a *transducer* to produce ultrasound waves. An ultrasonic transducer changes electric waves into mechanical vibrations, and vice versa. One type, called a *piezoelectric* transducer, includes a solid material that expands and contracts when placed in a varying electric current. One such material is quartz crystal, a hard rock. The expanding and contracting material creates ultrasound waves.

Ultrasound has many uses in science and industry. Ultrasound waves can clean tiny watch parts and other delicate objects by shaking loose the dirt. They also can mix liquids that do not dissolve by *emulsification* (the separation of a liquid into tiny droplets).

Ultrasound is used for measurement and detection because it can be focused like a beam of light at a small object. Ultrasound produces echoes, which are sound waves reflected off objects. The bones, fluids, and tissues of the human body each reflect ultrasound waves differently. Physicians use ultrasound echoes to detect brain tumors and other conditions. Ultrasound echoes also help doctors watch the growth of unborn children. In industry, ultrasound is used to test metals and plastics for defects. RICHARD W. HENRY

See also SOUND (Ultrasound; picture); TRANSDUCER; SONAR; AUTOMATION (picture: Ultrasonic Testing Equipment); MACHINE TOOL (New Developments).

ULTRAVIOLET RAYS are waves similar to light that lie just beyond the violet end of the visible light spectrum (see ELECTROMAGNETIC WAVES). They are sometimes known as *invisible light* or *black light*, because they cannot be seen by the human eye.

Sources of Ultraviolet Rays. Sunlight, or *white light*, is a mixture of light of all colors, or wavelengths. When sunlight passes through a glass prism, the colors spread out into a rainbowlike spectrum. Each wavelength falls in a different place. The red waves are the longest, and the violet rays are the shortest.

The glass prism absorbs most of the ultraviolet radiation. But if the prism is quartz instead of glass, the ultraviolet gets through, and can be detected in the place beyond the violet. The shortest violet rays we can see are only about $\frac{16}{1,000,000}$ inch (0.00041 millimeter) long. Ultraviolet rays range from this value to wavelengths about 100 times shorter. See SPECTROSCOPE.

The sun is a strong, natural source of ultraviolet rays, but the air, especially smoke and dust, absorbs much of this radiation. As a result, most of the shortest ultraviolet rays do not reach the earth's surface. This is fortunate, because extremely short waves harm the skin and the tissues of the body. The rays that cause sunburn lie in two portions of the ultraviolet range. One lies just below the shortest violet wavelength, and the other at about three-fourths of this wavelength.

Ultraviolet light, although invisible, can be detected in various ways. It registers better on photographic film than does visible light. Under the influence of ultraviolet rays, various oils, minerals, and chemicals become *fluorescent*, or give off visible light (see FLUORESCENCE).

Uses of Ultraviolet Rays. In fluorescent lamps, an electric current passing through mercury vapor produces ultraviolet light. A coating on the inside of the glass tube absorbs the ultraviolet radiation, and changes it into visible light. Coatings of different types produce various colors. See FLUORESCENT LAMP.

The fluorescent effects of ultraviolet rays have important industrial uses, such as testing materials, identifying ores in mining, and lighting the instrument panels of aircraft. Scholars use the fluorescent effect of ultraviolet rays to examine old documents.

Sun lamps produce ultraviolet light in much the same way as fluorescent lamps. But the glass tube is made of quartz or fluorite to allow the ultraviolet light to pass through readily. Special glasses must be worn in the presence of ultraviolet lamps, because ultraviolet light is harmful to the eyes. Some scientists believe ultraviolet radiation causes skin cancer. See SUN LAMP.

Certain ranges of ultraviolet rays can kill cells. These rays help sterilize water and milk, or the air in operating rooms. Modern food and drug plants use germicidal lamps to disinfect their products and the containers (see GERMICIDAL LAMP). Ultraviolet rays can also delay, and even change, the growth of cells.

Ultraviolet rays can also have a beneficial effect upon the human body, and have several important medical applications. They serve as a disinfectant. They also help heal wounds, and have been used to treat tuberculosis, rickets, and some skin diseases. Scientists have also found that they can help prevent rickets by treating foods such as milk and cereal with ultraviolet rays. This causes the formation of vitamin D, which is a strong preventive against rickets. Milk and eggs become more nourishing when exposed to ultraviolet rays.

One of the most recent uses of ultraviolet rays is in the field of rocket astronomy. A Geiger counter that is sensitive to ultraviolet rays is mounted inside a rocket. As the rocket soars above the earth's atmosphere, the Geiger counter scans the skies. The ultraviolet radiation it records shows the presence of clouds of gas in the space between stars in the galaxy. IRA M. FREEMAN

See also FOOD PRESERVATION (Ultraviolet Rays).

ULU, *OO loo*, is an Eskimo knife made of metal or chipped stone. Its flat, sharp blade is curved like a half moon. A handle is opposite the curved edge.

ULYSSES, a novel. See JOYCE, JAMES.

Painting on a cup (about 490 B.C.) by Douris; Kunsthistorisches Museum, Vienna

Ulysses was a leader of the Greek army during the Trojan War. The Greeks awarded him the armor of Achilles, the mightiest Greek warrior, after Achilles died in battle. This ancient Greek painting shows Ulysses, *right*, giving the armor to Achilles' son.

ULYSSES, *yoo LIHS eez*, was a king of Ithaca and a brave and cunning hero in Greek mythology. His name is *Odysseus* in Greek and *Ulysses* in Latin. Ulysses was noted for his cleverness. In early Greek writings, he also was generous and noble. Some later Greek writers portrayed him as a sly, deceitful trickster.

Most stories about Ulysses tell about his life during and after the Trojan War, a conflict between Greece and the city of Troy. Ulysses is a major character in the *Iliad* and the hero of the *Odyssey*, two epics by the Greek poet Homer. The *Iliad* deals with events in the last year of the Trojan War. The *Odyssey* describes Ulysses' adventures as he returns home after the war.

The Trojan War. Ulysses was the son of Laertes, the king of Ithaca, and Anticleia. But just before her marriage to Laertes, Anticleia had been seduced by Sisyphus, the king of Corinth. Some Greeks believed that Sisyphus was Ulysses' father.

Ulysses married Penelope, the daughter of Icarius, the king of Sparta. Soon after the birth of their son, Telemachus, a group of Greek leaders tried to recruit Ulysses to fight Troy. But Ulysses did not want to go to war. To avoid joining the army, he pretended to be insane. He yoked an ox and a donkey to a plow and sowed his fields with salt. Palamedes, a member of the group, suspected that Ulysses was faking insanity. Palamedes put Telemachus in the path of Ulysses' plow. Ulysses turned the plow aside to protect the baby and thus proved he was sane.

Ulysses reluctantly agreed to sail with the Greek army for Troy, but he never forgave Palamedes. After the Greeks arrived at Troy, Ulysses tricked them into believing that Palamedes was a traitor. The Greek soldiers then killed Palamedes.

During the Trojan War, Ulysses was a valiant fighter and a wise counselor to the Greek leaders. Ulysses showed his bravery by going on dangerous missions to spy on the Trojan forces. The Greeks honored him by giving him the armor of Achilles, the greatest Greek warrior, after Achilles' death.

Return to Ithaca. The Greeks finally defeated the Trojans after 10 years of fighting, and Ulysses set out by ship for Ithaca. During his return voyage, he visited the land of one-eyed giants called Cyclopes. Ulysses was captured by Polyphemus, a Cyclops, but escaped after driving a burning stake through the giant's eye. Polyphemus prayed for revenge to his father, Poseidon, the god of the sea. Poseidon became Ulysses' enemy and tried to prevent his return to Ithaca. Ulysses, largely with the help of the goddess Athena, finally reached home after 10 years of wandering and many thrilling adventures. For the story of his travels, see the WORLD BOOK article on the ODYSSEY.

During Ulysses' long absence, several noblemen had moved into his palace. The men claimed that Ulysses must have died, and they demanded that Penelope marry one of them. Penelope finally agreed to marry the man who could string Ulysses' huge bow and shoot an arrow through 12 hollow axheads.

Ulysses arrived at the palace the day before the archery contest, disguised as a beggar. Penelope, unaware of his identity, allowed him to enter the contest. He was the only one who could perform the feat. After revealing his identity, he killed the noblemen with the help of Athena, Telemachus, and loyal servants. He then was reunited with his wife. ROBERT J. LENARDON

See also TROJAN WAR; PENELOPE; POLYPHEMUS.

UMBEL. See INFLORESCENCE.

UMBELLIFERAE, *UM buh LIF er ee*, is the botanical name for the carrot or parsley family. The word comes from the same root as the word *umbrella*. Most members have flowers arranged in umbrella-like clusters. About 2,700 species of herbaceous plants are in this family. They are found in all parts of the world, but are most abundant in the North Temperate Zone. Some members of this family are poisonous, others have medicinal value, and others are useful foods. Carrots, celery, and parsnips are edible kinds of *Umbelliferae*. THEODOR JUST

Related Articles in WORLD BOOK include:

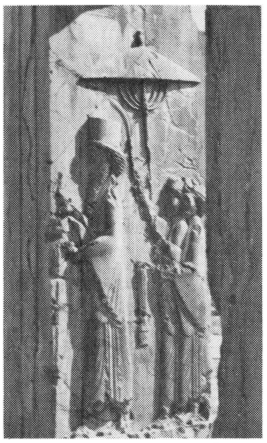
Anise	Celery	Dill	Herb
Caraway	Cicely	Fennel	Parsley
Carrot	Coriander	Hemlock	Parsnip

UMBER is a brown mineral pigment used to make certain oil and water-color paints. The mineral is ground, washed, and dried to make *raw umber*. When raw umber is heated, it becomes *burnt umber*, which has a deep reddish color. The name comes from Umbria, Italy, where the mineral was first found.

UMBILICAL CORD, *um BILL ih kuhl*, is a ropelike structure that connects the *fetus* (unborn child) to the *placenta* (see EMBRYO [Human Development]). The cord contains two arteries and one vein. The arteries carry blood containing waste products from the fetus to the placenta. The vein carries blood containing oxygen and food substances obtained from the mother's blood back to the fetus. When the baby is born, the doctor carefully cuts the umbilical cord at a point close to the baby's abdomen. The scar, which remains throughout life, is called the *umbilicus*, or *navel*. CARL C. FRANCIS

UMBRA. See PENUMBRA; SHADOW; SUNSPOT.

UMBRELLA. The name *umbrella* comes from a Latin word meaning *little shadow*. The first umbrellas originated as sunshades which the slaves of ancient Egypt and Assyria held over their masters. Even today, an umbrella is believed to be a mark of rank by people in some countries.



The Oriental Institute, University of Chicago

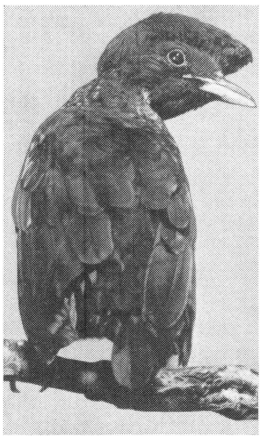
Umbrellas Were Used As Sunshades in ancient times. The carving, above, shows King Xerxes I of Persia using an umbrella.

In ancient Greece and Rome, women carried umbrellas. For a man to do so was regarded as effeminate. Umbrellas began to be used by both sexes in England during the 1700's. Today, people in all parts of the world use umbrellas as protection against the rain. The name *parasol* is often applied to umbrellas which are carried as sunshades. Large, folding beach umbrellas protect people from the sun.

There are many different kinds of umbrellas. Some are made so that they can be folded and carried in the pocket when not in use. Other umbrellas may be collapsed and hidden in a cane, which is then a walking stick. Umbrellas are made from many materials, including clear plastics. They come in all colors.

UMBRELLA BIRD lives in the tropical forests of South America. It is called the umbrella bird because of the tuft of plumes which rises from its crown and forms an umbrellalike crest over its head. A flap of skin covered with feathers hangs down from its neck. The flap looks like an umbrella handle. The bird is about the size of a crow. The umbrella bird has black feathers, edged with steel-blue.

Little is known about the habits of the umbrella bird. It lives in the tops of the highest trees, often on islands in the Amazon and other rivers.



New York Zoological Society

Umbrella Bird

Scientific Classification. The umbrella bird belongs to the cotinga family, *Cotingidae*. It is genus *Cephalopterus*, species *C. ornatus*.

RODOLPHE MEYER DE SCHAUENSEE

UMBRELLA TREE. See MAGNOLIA.

UMIAK. See ESKIMO (Transportation).

UMPIRE. See BASEBALL (Umpires); BASKETBALL (The Officials); FOOTBALL (The Officials).

UN. See UNITED NATIONS.

UNALASKA. See ALEUTIAN ISLANDS.

UN-AMERICAN ACTIVITIES COMMITTEE was the name of an investigating committee of the United States House of Representatives. It investigated the threat of *subversion* (overthrowing the government) by groups in the United States and recommended legislation to the House.

The House Committee on Un-American Activities (HUAC) grew from a special investigating committee that was established in 1938. It became a *standing* (permanent) committee in 1945. In 1969, the House changed the committee's name to the Committee on Internal Security. The House abolished the committee in 1975.

The committee's main interest was to search for Communist influence inside and outside the government. After World War II ended in 1945, many people viewed such investigations as a contribution to the struggle against world Communism. President Harry S. Truman established a loyalty-security program in 1947 after it was discovered that some Communists had held jobs within the government before and during the war. The committee also investigated the activities of other radical or extremist groups.

The committee received attention in 1947 for its hearings on the influence of Communism in the motion-picture industry. But it gained its greatest fame in 1948 during its investigation of Communists in the Department of State. Its hearings led to the perjury trial and conviction of Alger Hiss, a former high official of the department (see HISS, ALGER). Representative Richard M. Nixon of California, a committee member, played a key role in the investigation (see NIXON, RICHARD M. [U.S. Representative]).

After the Hiss case, the Un-American Activities Committee looked into suspected Communist influence in almost all areas of life. Committees in the U.S. Senate and in state legislatures also investigated Communist influence. As a result, public employees and a number of employees in private industries had to take loyalty oaths. Persons accused of Communist associations were *black-listed* (denied employment) by some firms.

The committee's critics charged that it often abused its investigative power and violated the constitutional rights of witnesses. They maintained that persons labeled as subversives should have the right to cross-examine their accusers. Others believed that the discovery of conspirators should be the responsibility of the police, the FBI, and the courts. Decisions by the Supreme Court of the United States in the 1950's and 1960's curbed the committee's activities. For example, the court ruled that witnesses may refuse to answer any questions that are not related to the matter under investigation.

HARVEY GLICKMAN

UNAMUNO, MIGUEL DE (1864-1936), was a Spanish philosophical essayist, poet, novelist, and dramatist. The leading humanist of modern Spain, he argued that individual man—not civilization, society, or culture—was "the subject and supreme object of all thought."

Unamuno's best-known work, *The Tragic Sense of Life* (1912), examines the conflict between faith and reason from the Renaissance to the 1900's. In this book, the author evaluates the significance of will, the desire for immortality, and the search for love in human history. Unamuno's study of Spanish culture in *Concerning Traditionalism* (1895) helped stimulate the Spanish intellec-

tual revival known as the Generation of 1898. His finest poem is the long meditation called *The Christ of Velázquez* (1920). His best novel, *Mist* (1914), examines the mysteries of human existence.

Miguel de Unamuno y Jugo was born in Bilbao. He was appointed professor of Greek at the University of Salamanca in 1891 and rector in 1900. In addition to many books, he wrote over 3,000 short essays and articles. A bold political critic, he incurred the hostility of four successive Spanish governments. PETER G. EARLE

UNAU. See SLOTH.

UNCAS, *UNG kus* (1588?-1683?), was a chief of the Mohican, or Mohegan, Indians in Connecticut during colonial times. He became noted for his assistance to the English settlers, and his name has been perpetuated in the character Uncas in James Fenimore Cooper's book, *The Last of the Mohicans* (see MOHICAN INDIANS).

Uncas joined the English in a war against the Pequot Indians in 1637. He defeated the Narraganset tribe in 1643, and five years later fought the Mohawk, Narraganset, and other tribes. Uncas helped the English settlers, but opposed Christianity in his tribe. The English settlements along the Connecticut River probably owed their survival to his help against the Pequot Indians.

A monument to Uncas was erected by the citizens of Norwich, Conn., in 1847. Another monument to his name was erected on the site of the home of James Fenimore Cooper, at Cooperstown, N.Y. WILLIAM H. GILBERT

UNCLE REMUS. See HARRIS, JOEL CHANDLER.

UNCLE SAM is a figure that symbolizes the United States. The term originated as an unfriendly nickname for the U.S. government during the War of 1812.

The term "Uncle Sam" was apparently derived from the large initials "U.S." that Samuel Wilson, an Army meat inspector and provisioner, stamped on barrels of salted meat. People in upper New York and Vermont who opposed the war used the nickname. It first appeared in a Troy, N.Y., newspaper in 1813 and spread rapidly. In 1816, the nickname appeared in a book title, *The Adventures of Uncle Sam.*

The costume of Uncle Sam, decorated with stars and stripes, originated in the cartoons of the 1830's. Seba Smith, a humorous political essayist, was cartooned as Uncle Sam, with such a costume. A clown of the 1800's, Dan Rice, made the costume popular. In 1961, Congress passed a resolution recognizing Uncle Sam as a national symbol. MERRILL JENSEN

See also BROTHER JONATHAN.

UNCLE TOM'S CABIN is a famous antislavery novel by the American author Harriet Beecher Stowe. It first appeared as a serial in the abolitionist magazine *National Era* in 1851 and 1852. The novel was published as a book later in 1852 and quickly became a best seller in the United States and Great Britain.

Stowe wrote *Uncle Tom's Cabin* to criticize slavery, which she considered a national sin. She hoped her novel would help bring slavery to an early and peaceful end. But the book increased the hostility of many Northerners toward the South. Southerners, on the other hand, considered Stowe's description of slavery inaccurate. They called it an insult and an injustice to their region. Historians believe that the bitter feelings aroused by the book helped cause the Civil War (1861-1865).

The chief character in *Uncle Tom's Cabin* is Uncle Tom, a dignified old black slave. The story describes Tom's experiences with three slaveholders. Two of them —George Shelby and Augustine St. Clare—treat Tom kindly. But the third, Simon Legree, abuses Tom and has him brutally beaten for refusing to tell where two escaped slaves are hiding. Tom dies from the beating. A subplot of the novel tells about a family of slaves—George and Eliza and their baby—who flee to freedom in Canada. In one famous episode, Eliza, clutching her baby, escapes across the frozen Ohio River from pursuing slave catchers. Two other characters in the book

UNCLE SAM THROUGH THE YEARS

American Antiquarian Society

1834 Uncle Sam was pictured as a young man without a beard or gray hair in early cartoons.

© Punch

1869 Uncle Sam is not always popular. A British cartoonist pictured him as a tightwad after the Civil War.

Library of Congress

1917 Uncle Sam urged men to enlist in the U.S. Army. James Montgomery Flagg painted this poster of World War I.

Jensen, *Chicago Daily News*

1961 An elated Uncle Sam received the news that the first American astronaut had successfully flown into outer space and returned safely.

United Press, Int.

1941 Uncle Sam asked men and women to work in World War II defense plants. McClelland Barclay designed this well-known poster.

Engraving (1852) by Hammat Billings, The Newberry Library, Chicago

Uncle Tom's Cabin **describes the effects of slavery on both slaves and masters. In one scene, *left,* Eliza, a young slave, secretly visits Uncle Tom and his wife, Aunt Chloe. Eliza tells them that Tom and her baby have been sold to a slave dealer. Eliza also reveals her plan to flee to the North with her child.**

are Topsy, a mischievous black girl, and Little Eva, St. Clare's young daughter. The death of Little Eva is another famous episode.

The novel presents a realistic account of American life 10 years before the Civil War. Stowe created a vivid picture of Southern life, with Tom being sold from one slaveowner to another. *Uncle Tom's Cabin* also describes the upper Midwest as seen by George and Eliza as they flee northward into Canada.

After the Civil War, *Uncle Tom's Cabin* became known chiefly through abridgements of the novel and by plays based on the book. However, these versions distorted the original story and characters. By the late 1800's, most people believed that *Uncle Tom's Cabin* dealt primarily with the death of Tom and Little Eva, Topsy's antics, and Eliza's escape. The term "Uncle Tom" came to stand for a black man who, for selfish reasons or through fear, adopts a humble manner to gain favor with whites. But the novel portrayed Tom as a brave man who dies rather than betray two fellow slaves. Few people realized that Simon Legree, the cruel villain, was a Northerner, and that Augustine St. Clare, a Southerner, recognized the evils of slavery.

The famous American critic Edmund Wilson wrote that reading *Uncle Tom's Cabin* for the first time may be a "startling experience." He stated that "it is a much more remarkable book than one had ever been allowed to suspect." CHARLES H. FOSTER

See also STOWE, HARRIET BEECHER; AMERICAN LITERATURE (Abolition and *Uncle Tom*).

UNCONDITIONAL SURRENDER. See GRANT, ULYSSES S. ("Unconditional Surrender" Grant).

UNCONSCIOUS, in psychology, is the part of the mind that rarely has awareness, or consciousness. It may contain information that has never been conscious, or that was once conscious but is now unconscious. See also PSYCHOANALYSIS; SUBCONSCIOUS.

UNCONSCIOUSNESS. See FAINTING; FIRST AID.

UNCTAD. See UNITED NATIONS (Working for Progress).

UNCTION. See ANOINTING OF THE SICK.

UNDERDEVELOPED COUNTRY, sometimes called DEVELOPING COUNTRY, is any one of the world's poor, or "have-not," nations. A typical underdeveloped nation has a shortage of food, few sources of power, and a low Gross National Product (GNP). GNP is the value of all the goods and services produced by a country during a year. Economists often classify nations on the basis of *per capita* (for each person) GNP—that is, the GNP divided by the population. The per capita GNP in underdeveloped countries is less than $325. This compares to an average of about $3,800 in developed countries, and nearly $6,200 in the United States.

Most underdeveloped countries have an increasing population, chiefly because death rates are decreasing and birth rates remain high. These population increases put new pressures on scarce resources. *Physical capital,* such as machinery and efficient transportation systems, is scarce in underdeveloped countries. So is *social capital,* such as good education and health systems and stable government. Disease, illiteracy, and inadequate equipment keep agricultural and commercial production low. These factors are most harmful in rural areas, where most of the people live. The people depend on one or two main crops, and suffer if these crops fail.

Richer nations are helping some underdeveloped countries conquer poverty. But three-fourths of the world's people still live in underdeveloped countries. For more detailed information, see WORLD (Economy of the World). JOHN R. COLEMAN

See also PEACE CORPS; ECONOMICS (Underdeveloped Economies); TECHNICAL ASSISTANCE; UNESCO; UNICEF; GREEN REVOLUTION; HOPE, PROJECT.

UNDERGROUND, in political terms, is a secretly conducted movement to overthrow the government or the military occupation forces of a country. Underground tactics have been used since early history, but reached a high point of activity during World War II (1939-1945). Since then, Communist groups have worked underground in attempts to overthrow many governments.

Adolf Hitler used an underground group called the *fifth column,* especially in the early stages of World War II (see FIFTH COLUMN). German agents worked inside various countries before and during the German invasions of those countries. The agents used espionage, propaganda, and sabotage to aid the German cause and destroy the invaded country's morale.

But once the Germans had conquered a country, the underground of that country's patriots hampered German operations. Underground workers sprang up in France, Belgium, The Netherlands, Denmark, Norway, Yugoslavia, and other conquered countries. They plagued the Germans by blowing up railroad trains and bridges, sabotaging factories, distributing illegal newspapers, rescuing marooned Allied servicemen, and gathering valuable military information.

See also CHETNIK; GUERRILLA WARFARE; MAQUIS; PARTISANS; WORLD WAR II (Underground Resistance).

UNDERGROUND RAILROAD was a system for helping Negro slaves escape to the northern states and to Canada in the days before the Civil War. It was really neither underground nor a railroad. It was called the underground railroad because of the swift, secret way in which Negroes seemed to escape.

The underground railroad had no formal organization. A large part of its work was done by southern slaves who, though unable to escape themselves, helped runaways with food, clothing, and directions. Free Negroes in both the South and the North frequently assisted the runaways. The most famous Negro "railroader" was Harriet "Moses" Tubman (1820?-1913). She was a fugitive herself, but she returned to the South 19 times and helped about 300 Negroes escape. A $40,000 reward was offered for her capture.

The work of northern white abolitionists in manning the *stations* (hiding places) of the underground railroad, and in helping the slaves move from one refuge to another, has often been exaggerated. There were few such "agents" and there was little organized activity. But many Quakers and persons of other faiths who felt that slavery was an evil were involved.

About 50,000 slaves escaped between 1830 and 1860. The underground railroad was most active in Ohio and Pennsylvania. But by the outbreak of the Civil War, runaways were being helped in every northern state from New England to Kansas.

Many fugitive slaves settled in the northern free states. But when Congress passed a strict fugitive slave law as part of the Compromise of 1850, thousands of these settled Negroes fled to Canada for safety. See FUGITIVE SLAVE LAW; COMPROMISE OF 1850.

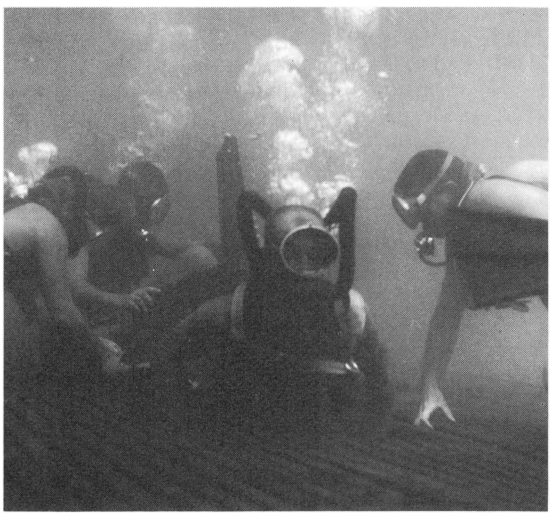
The underground railroad angered many southerners. This contributed to the sectional ill-feeling that led to the outbreak of the Civil War. DAVID HERBERT DONALD

See also ABOLITIONIST; TUBMAN, HARRIET.

UNDERGROUND RAILWAY. See SUBWAY.

UNDERTAKER. See FUNERAL DIRECTOR.

UNDERTOW. When strong waves beat against a shore, their force causes a current, or undertow, under the surface which flows away from shore to sea. Undertows are dangerous to swimmers.



U.S. Navy

UDT Men Leave a Submarine to carry out their assignments. They re-enter the submarine while it is still submerged.

UNDERWATER DEMOLITION TEAM (UDT) is a highly trained special volunteer unit of the United States Navy that performs dangerous assignments in the water. UDT men are sometimes called *frogmen*.

The primary UDT wartime mission is to find and clear obstacles from assault beaches in preparation for amphibious invasions. Many types of underwater obstacles are used to protect shores from invasion. These obstacles include mines, steel and concrete barriers, sharpened stakes, barbed wire, and log barriers. Nature provides additional obstacles such as coral reefs, sand bars, and underwater rock formations.

On a typical wartime mission, UDT men are assigned to locate obstacles near the assault beach. They approach the beach in small, fast boats called LCPR's. The LCPR's speed toward the *drop line* on a zig-zag course to avoid enemy fire. As the boats approach the drop line, the UDT men put on their swim fins, face masks, and diving equipment. On signals from the boat officers, two swimmers, called a *buddy pair*, roll over the sides of each LCPR into the water at evenly spaced intervals while the boats move at top speed.

Each buddy pair is assigned an area in which to take depth soundings, locate and describe the types and position of obstacles, and note enemy installations.

After the swimmers record the needed information, they swim to the *pick-up line*. On a signal, the LCPR's, speed to the line. Pick-up men ride in rubber boats tied alongside the LCPR's. The pick-up men pull the swimmers into the boats with hard rubber slings placed over the swimmers' extended arms. All this is done while the LCPR's travel at top speed. When the swimmers have been picked up, the LCPR's return to their ship.

Aboard ship, experts study the information gathered by the frogmen and prepare charts of the beach. After all information has been analyzed, the UDT men prepare packages of high explosives called *demo-packs*. These are used to destroy beach obstacles. The swimmers return to the beach and place the demo-packs on the obstacles. They pull the fuses and swim rapidly to the pick-up line, where they are picked up as before.

UDT men also perform dangerous peacetime tasks, such as ice demolition, harbor clearance, ship and aircraft salvage, and underwater search operations.

Training. UDT volunteers must complete 21 weeks of extremely difficult training. Usually, less than one-third of the candidates complete the course. Training is conducted at the Naval Amphibious Schools at Little Creek, Va., and Coronado, Calif.

The first three weeks of training emphasize physical conditioning. The trainees run, crawl, and climb through obstacle courses, make long forced marches, and take 5-mile (8-kilometer) runs. They learn to use rubber boats and small man-propelled craft.

During the fourth week, called "Hell Week," trainees spend many hours in ocean water, surf, swamps, and mud flats. They paddle in rubber boats for 20 miles (32 kilometers). They make all-night forced marches and run through rugged "confidence" courses that contain demolition charges and live machine gun fire.

Those who complete the first four weeks of training

spend the next 11 weeks in detailed classroom study and practical field work. They learn demolition techniques, advanced swimming, hand-to-hand combat, water survival, reconnaissance, chart making, and intelligence study. They also become qualified divers, skilled in the use of different types of diving equipment.

The candidates then train in isolated areas. There they perform UDT wartime missions under simulated combat conditions, working from dawn until midnight every day. This training determines which trainees will be assigned to operating units.

Candidates who qualify for UDT units spend their final three weeks of training at the U.S. Army Airborne School at Fort Benning, Ga., where they become qualified military parachutists. Then, they are assigned to operating teams. They must serve a six-month trial period before they earn the right to be called *frogmen*.

History. The first UDT men were not swimmers. They were organized as Naval Combat Demolition Units (NCDU), assigned to clear obstacles from the beaches before Allied landings in North Africa and Europe. In 1944, they cleared thousands of mines and obstacles from Normandy's "Omaha" and "Utah" beaches. Some units suffered over 50 per cent casualties.

The first UDT's were formed in the Pacific area. A disastrous amphibious landing on the island of Tarawa showed the need for swimmers to study beaches and clear obstacles. UDT's played an important role in later island invasions in the Pacific.

Frogmen scouted and cleared beaches during the Korean War. They also made many inland raids and destroyed inland tunnels, dams, and bridges.

The four active UDT units now consist of about 100 men and 15 officers each. Two units are assigned to the U.S. Atlantic Fleet, and two are assigned to the U.S. Pacific Fleet. WENDELL E. WEBBER

UNDERWOOD, OSCAR WILDER (1862-1929), an Alabama Democrat, served in the U.S. House of Representatives from 1895 to 1896 and 1897 to 1915. He served in the U.S. Senate from 1915 to 1927. In 1913, he sponsored the Underwood Tariff Act. This tariff law lowered rates on imports and removed the duties on milk, sugar, wheat, eggs, raw wool, shoes, and other items. Underwood served as a delegate to the Washington, D.C., Conference from 1921 to 1922. He was born in Louisville, Ky., and moved to Alabama in 1884.

UNDERWOOD TARIFF ACT. See WILSON, WOODROW (Legislative Program).

UNDERWRITING is a term first used in England in the early 1700's. *Underwriters* (insurers) wrote their names at the bottom of proposed insurance contracts covering a ship and its cargo. They indicated in this way their willingness to assume part of the risk.

Today, every insurance company has an underwriting department which is important to the success of the firm. Underwriting experts must establish the premium rates for various kinds of policies and the amount and degree of risk to be assumed for each policy.

Underwriters also examine all applications for insurance in order to guard against bad risks and to prevent the company from assuming too many of the same kinds of risks. For example, a fire insurance underwriter may find that several suspicious fires have occurred in the building to be insured, and decide the risk is bad.

In finance, underwriting is an agreement to purchase a corporation stock or bond issue. ROBERT D. PATTON

See also INSURANCE; LLOYD'S.

UNDSET, *OON set*, **SIGRID** (1882-1949), a Norwegian author, won the 1928 Nobel prize for literature. *Kristin Lavransdatter* (1920-1922), her major work, is an epic trilogy of life in Norway during the Middle Ages. It consists of the novels *The Bridal Wreath*, *The Mistress of Husaby*, and *The Cross*. The novels tell the story of Kristin—her childhood, stormy marriage, and dedication to Christian service after the death of her husband. The displacement of heathen customs by Christian ideals in medieval Norway is dealt with in a second but less impressive epic, *The Master of Hestviken* (1925-1927). The series consists of *The Axe*, *The Snake Pit*, *In the Wilderness*, and *The Son Avenger*.

Alfred A. Knopf

Sigrid Undset

Miss Undset was born in Kalundborg, Denmark. She was the daughter of Ingvald Undset, a distinguished Norwegian archaeologist. Her father awakened in her a strong interest in the Middle Ages. After he died, Miss Undset gave up plans for a career as a painter and went to work in an Oslo business office. While working there from 1899 to 1909, she gathered impressions which she used in her early realistic stories of contemporary lower-middle class life.

Jenny (1911), her first novel to attract widespread attention, deals with the sexual problems of a female artist. Miss Undset wrote other novels about life in her time. They include *The Wild Orchid* (1929) and *The Burning Bush* (1930), stories of a man's conversion to Roman Catholicism. They reflect Miss Undset's own conversion to Catholicism in 1924. Miss Undset took refuge in the United States from 1940 to 1945, while the Nazis occupied Norway. She lectured and wrote while in the United States. RICHARD B. VOWLES

UNDULANT FEVER, *UN dyoo lunt*, is an infectious disease so named because the fever of the patient *undulates* (varies from time to time). British soldiers seem to have acquired it first on the island of Malta. Therefore, they called it *Malta fever*.

A person may get undulant fever by drinking milk from animals which have the disease, or by handling raw meat from infected animals. Many persons in farm communities still drink unpasteurized milk. Undulant fever is a serious danger in such places.

The first symptoms appear from 10 to 15 days after a person becomes infected. He feels weak, tired, and chilly, loses his appetite, and has general aches and fevers. The disease often develops so slowly that the patient does not realize he is sick. The fever mounts slowly. Only about two out of every 100 cases result in death. But the disease often damages important organs. A combination of streptomycin and sulfa drugs has proved an effective treatment. PAUL R. CANNON

See also BANG'S DISEASE.

UNEARNED INCREMENT. See SINGLE TAX.

UNEMPLOYMENT is the state of a person who wants to work but does not have a job. The term does not refer to people who are not seeking work because of age, illness, or a mental or physical handicap. Nor does it refer to people who are attending school or keeping house. Such persons are classified as out of the labor force rather than unemployed.

Unemployment involves serious problems for both the individual and society as a whole. For the individual, it means loss of income and, in many cases, of self-respect. For society, it results in lost production and, in some cases, criminal or other antisocial behavior.

Until the 1900's, most people considered laziness the main cause of unemployment. But today, they realize that men and women may be out of work through no fault of their own.

Unemployment in the United States

Measuring Unemployment. The Bureau of the Census in the Department of Commerce collects and tabulates unemployment statistics in the United States. The Bureau of Labor Statistics in the Department of Labor analyzes and publishes the statistics. Every month, agents of the bureau visit a certain number of households in all parts of the country. They ask whether the members of each household who are 16 or older have jobs or are looking for work. The answers provide the basis for a monthly estimate of the nation's total labor force. The bureau also reports the *unemployment rate*, the percentage of the total labor force that is unemployed. If 85 million persons were employed and 5 million were unemployed, the bureau would report a total labor force of 90 million and an unemployment rate of 5.6 per cent. Businessmen, economists, and government officials study the reports for indications of the nation's economic health.

The annual U.S. unemployment rate represents the average of the monthly figures for a certain year. It shows the average number of persons unemployed during the year, but not the total number who had some unemployment. In 1971, the average number of unemployed was about 5 million. However, almost 16 million persons experienced at least one week of unemployment during the year.

The unemployment rate varies greatly among various groups. It tends to be several times as high for teenaged workers as for older persons. Unskilled people experience about three times as much unemployment as do white-collar workers. The unemployment rate among Negroes is about twice that among whites.

Economists disagree on the meaning of the unemployment rate. Some believe the rate exaggerates the problem because it includes persons who want only part-time jobs. Others argue that it underestimates the problem. They point out that the rate does not include discouraged workers who have stopped looking for jobs or workers who have taken jobs below the level of their skill.

Types of Unemployment. Some economists classify unemployment into three categories, according to the basic causes. These categories are (1) normal, (2) structural, and (3) deficient demand.

Normal Unemployment exists even when jobs are plentiful. Such unemployment includes workers who have quit their jobs or have been fired, and need some time to find other jobs. Normal unemployment also includes individuals, such as young people and former homemakers, who want employment but have not yet found their first job.

Another kind of normal unemployment, called *seasonal* unemployment, occurs in industries that lay off workers during certain seasons each year. These industries include agriculture, construction, and shipping.

Structural Unemployment exists when individuals seeking work have the wrong skills for the available jobs. For example, many coal miners may be looking for work at the same time that the nation has a shortage of salesmen and stenographers. Structural unemployment also includes individuals in the wrong location to fill available jobs.

Structural unemployment includes *technological* unemployment, which results from the development of new products, machinery, or manufacturing methods. Such developments produce rapid changes in the demand for various skills. The total number of employment opportunities does not decline, but the number of jobs in certain occupations may grow less rapidly than in others or may even decline. In 1947, for example, clerical and professional workers made up only 19 per cent of all employed persons. By 1971, such workers accounted for 31 per cent of the total. At the same time, the proportion of unskilled workers declined from 12 per cent to 7 per cent of the total. See AUTOMATION (Automation and People).

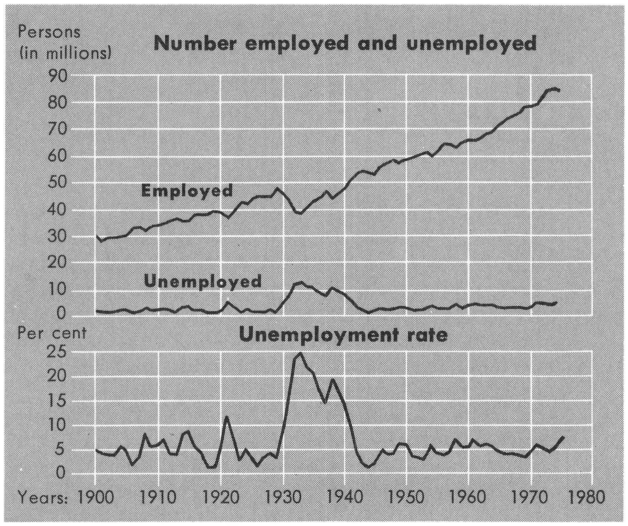
Deficient Demand Unemployment results from a general lack of need for workers when the nation's total spending is too little. As goods and services remain unsold, industries reduce production and lay off employees. Deficient demand unemployment is called *cyclical* unemployment if it occurs during periods of decreased business activity. But it also can occur during periods of increasing activity if the number of workers grows faster than the number of jobs.

The severest deficient demand unemployment in U.S. history occurred during the Great Depression of the 1930's. The unemployment rate reached about 25 per cent in 1933 and remained above 14 per cent through 1940. After the United States entered World War II in 1941, the government began to spend huge amounts for military purposes. By 1944, the unemployment rate had dropped to 1.2 per cent.

In the late 1950's and early 1960's, the unemployment rate rose to more than 6 per cent. Some economists thought the unemployment was structural and resulted from changes in the types of jobs available. Others thought it was deficient demand unemployment that resulted from too little spending. Then, in 1964, a tax cut allowed people to spend more money, and the government spent more on the Vietnam War. By 1966, unemployment had fallen to a 12-year low. Because the increase in spending reduced unemployment, economists saw that the problem had been deficient demand unemployment. In 1969, the government reduced spending in order to curb inflation, and unemployment rose again. By 1975, the unemployment rate had climbed to over 8 per cent, the highest level since 1941.

Fighting Unemployment. The United States government has fought each type of unemployment differently.

EMPLOYMENT AND UNEMPLOYMENT IN THE UNITED STATES*



Sources: Lebergott, Stanley. *Manpower in Economic Growth: The American Record Since 1800.* McGraw-Hill, 1964; U.S. Bureau of Labor Statistics.

Year	Employed	Unemployed	Unemployment Rate (%)
1900	29,956,000	1,420,000	5.0
1905	30,918,000	1,381,000	4.3
1910	34,559,000	2,150,000	5.9
1915	36,223,000	3,377,000	8.5
1920	39,208,000	2,132,000	5.2
1925	43,716,000	1,453,000	3.2
1930	45,480,000	4,340,000	8.7
1935	42,260,000	10,610,000	20.1
1940	47,520,000	8,120,000	14.6
1945	52,820,000	1,040,000	1.9
1950	58,920,000	3,288,000	5.3
1955	62,171,000	2,852,000	4.4
1960	65,778,000	3,852,000	5.5
1965	71,088,000	3,366,000	4.5
1970	78,627,000	4,088,000	4.9
1975†	83,625,000	8,131,000	8.6

*Based on a sample of households throughout the country: for 1900-1946, persons 14 years old and over; after 1946, persons 16 years old and over.
†Average of January-June.

To combat normal unemployment, the government has established public employment agencies that inform unemployed workers of suitable job openings. To attack structural unemployment, the Manpower Development and Training Act of 1962 set up programs to train workers in skills required for available jobs. The Economic Opportunity Act of 1964 also provided help for workers requiring retraining or other special assistance.

The fight against deficient demand unemployment presents especially serious problems. If unemployment rises, the government may increase its spending in order to create jobs. But such spending can cause rising prices and other problems of inflation. The government may then have to choose between the evils of unemployment and those of inflation.

Some economists believe that unemployment rates as low as 3 to 4 per cent should no longer be expected. They note that beginning in the 1960's higher proportions of women and young people entered the labor force than ever before. These two groups have higher rates of unemployment than the rest of the population.

Some persons believe the government must become the *employer of last resort* if industry cannot use the nation's total labor force. Under such a program, the government would create a job for any person who could not find one. The Emergency Employment Act of 1971 moved toward this goal. It provided federal funds for state and local governments to hire the unemployed.

Unemployment in Canada

Canada has the same types of unemployment that occur in the United States. However, seasonal unemployment is a much more serious problem in Canada because of the longer and colder winter.

In 1961, Canada's annual unemployment rate rose above 7 per cent, the highest since the nation began recording unemployment in 1946. After the government took strong action to fight unemployment, the rate fell below 4 per cent in 1965 and 1966. But the total labor force grew faster than the number of jobs because more and more women sought employment. In 1971, the annual unemployment rate reached a 10-year high of 6.4 per cent. In early 1975, unemployment reached nearly 7 per cent, the highest level since 1961. As in the United States, the risk of further inflation discouraged government spending to create jobs. HERBERT S. PARNES

Related Articles in WORLD BOOK include:

Depression
Employment
Employment Agency
Employment Service, U.S.
Great Depression
Inflation and Deflation (Effects of Recession)
Poverty
Recession
Unemployment Insurance

UNEMPLOYMENT INSURANCE is a means of protecting workers who are out of work and looking for employment. These workers receive cash payments, usually each week for a limited period. Most of the industrial countries of the world have unemployment insurance systems. About 30 such programs are in effect in Europe, North America, Australia, and New Zealand.

Trade unions adopted the first plans to help able-bodied wage earners who were temporarily out of work through no fault of their own. In Great Britain, the Journeymen Steam Engine Makers' Society began paying out-of-work benefits as early as 1824. In the late 1800's and early 1900's, Switzerland, Belgium, Denmark, France, Norway, and other European countries began public voluntary unemployment insurance plans. In 1911, Great Britain set up the first compulsory unemployment insurance system. After World War I, it began paying various types of allowances, commonly called the *dole*, to unemployed workers who had used up their unemployment benefits. In 1932, Wisconsin adopted the first U.S. unemployment insurance law. A federal-state unemployment insurance plan was established as part of the Social Security Act of 1935.

United States Plan. The Federal Unemployment Tax Act levies a 3.2 per cent payroll tax on employers who employ workers in each of 20 weeks within a year. No tax is payable on wages over $4,200 a year. But the law provides that in states that have unemployment insurance acts meeting federal standards, the federal government collects only 0.5 per cent of the payroll tax.

This is returned to the states for administrative expenses and, in some cases, for benefits.

The states determine the tax rate each employer must pay for unemployment insurance. The rate usually depends on his unemployment experience. These rates vary generally from as low as zero to more than 2.7 per cent. The national average is about 2 per cent. In Alabama, Alaska, and New Jersey, employees also contribute a small amount. Each state places the money it collects in the Unemployment Trust Fund of the United States, and withdraws it as needed. The secretary of the treasury administers the fund.

Unemployment insurance protection covers most workers in industry and commerce, and includes civilian federal employees. Some state systems cover more workers than the federal law requires, such as employees of small firms and state and local government employees. Some states also tax yearly wages of more than $4,200. Railroad workers have their own separate system. In 1955, several large corporations adopted plans to pay their workers unemployment benefits in addition to the amounts paid by the government.

State Regulations. Each state has different benefit provisions. The unemployed worker must apply at the employment service office both for benefit payments and for getting suitable work. He must also report regularly to receive his benefits and to show that he will take a possible job. To qualify for benefits, a worker must have had a certain amount of covered work in a preceding period, usually a year. In most states, the minimum amount of wages required in this base period ranges from $300 to $800. Most states have a one-week waiting period before benefits are payable. The average maximum period for benefit payments is 26 weeks.

The amount of the benefit is usually determined from the average wage in the 3 months of the base period that had the highest wages. This average is often adjusted upward to allow for possible unemployment even in that period. The benefit is then computed at half the adjusted average wage, but with certain minimums and maximums. The minimum payment is usually about $10 to $20 a week. The maximum is usually from $50 to $80 a week, but several states pay as high as $90.

A dozen states pay extra benefits for dependents. The benefit is usually a flat amount for each dependent, such as $3 to $5 a week, subject to a maximum total. In these states, the total benefits that workers with dependents can get may be as high as $100 to $130 a week.

During the early 1970's, unemployment insurance benefits paid under state laws totaled about $5 billion. About 1½ million workers received weekly benefits. The average benefit totaled about $56 a week. At the same time, the number of workers covered by unemployment insurance averaged about 57 million. The Unemployment Trust Fund had total assets of about $9 billion.

Canadian Plan. The Canadian unemployment insurance plan went into effect in 1941, and applies uniformly in all provinces. All commercial and industrial workers are covered. They pay 0.8 per cent of their pay up to $150 a week. Employers pay from 0.8 to 1.6 per cent. These basic rates can vary by 10 per cent, depending upon unemployment levels. The national government pays for excess benefits resulting from a general unemployment level of more than 4 per cent. After a 2-week waiting period, payments may extend to 51 weeks. Benefits range from about 67 per cent of a single worker's earnings to 75 per cent for a worker with dependents, up to a maximum of $100 per week.

Similar benefits apply for sickness and maternity cases, but only up to 15 weeks. Employers with suitable private plans may contract out of the government plan and pay a lower tax rate that applies only to unemployment benefits. ROBERT J. MYERS

See also SOCIAL SECURITY; UNEMPLOYMENT; WELFARE.

UNESCO is a specialized agency of the United Nations. Its full name is UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION. UNESCO works for understanding and cooperation among people everywhere. It tries to promote a respect for justice, rule of law, human rights, and basic freedoms for all people. It was established in 1946 and has headquarters in Paris. UNESCO has 131 members. The agency carries out programs only at the request of its members. These nations provide most of its funds.

UNESCO stresses education, the spread of culture, and an increase in scientific knowledge. It stimulates scientific research on such basic problems as the use of arid lands and a knowledge of the world's oceans. UNESCO encourages artists, scientists, teachers, and students to travel, study, and work in other countries. It sponsors model libraries and art exhibits. It advises governments on how to restore and preserve national monuments. The organization tries to increase the free flow of information. UNESCO works with other UN agencies in providing technical aid to underdeveloped areas. UNESCO considers education the first need in improving human conditions in these areas.

How UNESCO Works

Education. UNESCO helps develop education at all levels. It sponsors programs to train teachers, build courses of study, and carry out research in education. UNESCO has started programs in several countries to develop methods of teaching people how to read and write. UNESCO also sponsors permanent and mobile libraries. Its library in Delhi, India, was the first public library open to all castes and creeds in India.

Science. UNESCO promotes international scientific cooperation. It encourages research in the basic sciences. It develops studies and research on natural resources. In 1952, it helped establish the European Council for Nuclear Research, which carries on research on the peaceful uses of atomic energy. UNESCO maintains science cooperation offices in Latin America, the Middle East, South Asia, and Southeast Asia. These offices help with training programs, scientific conferences, and the distribution of scientific materials.

UNESCO tries to apply the social sciences to special problems of interest to the organization. These problems include race relations, the status of women in society, and the social results of technological changes. In 1956, UNESCO and the government of India established a center to study the effects of industrialization in southern Asia. UNESCO encourages more standardization of statistical data throughout the world. It also stimulates social science teaching and research.

Culture. UNESCO concentrates on international cultural cooperation. For example, it led efforts to save Nile Valley archaeological treasures that might have been lost under the lake formed by the Aswan High Dam in Egypt. UNESCO tries to acquaint the public with important works of art and literature and promotes international copyright agreements. It works for the growth of museums and of studies in the humanities. UNESCO produces and distributes reading materials in developing areas. The agency does this chiefly through the UNESCO regional center in Karachi, Pakistan.

Information. UNESCO works to improve the distribution of information throughout the world. Each month it publishes the *UNESCO Courier* in Arabic, English, French, German, Hebrew, Hindi, Italian, Japanese, Persian, Russian, Spanish, and Tamil. UNESCO provides technical aid for nations in developing newspapers, radio, television, and films.

How UNESCO Is Organized

The General Conference of UNESCO consists of delegates appointed by the member nations. It meets every two years. The conference determines UNESCO policies and programs. It approves the budget and passes on financial and staff regulations. The conference selects the Executive Board and appoints the Director-General of UNESCO. It admits new members to UNESCO and adopts conventions and recommendations for approval by the member nations. General Conference delegates have met in several major cities of the world, but most conferences have been held in Paris.

The Executive Board has 34 members. They serve six-year terms. They are selected from among the delegates to the General Conference. The board meets in regular session at least twice a year. It supervises work on UNESCO programs and prepares the agenda for the General Conference. It recommends new members and nominates the Director-General.

The Secretariat is headed by the Director-General. He is the chief administrative officer of UNESCO and has offices at UNESCO headquarters in Paris. More than a thousand persons work in the Secretariat. They come from over half of the member nations. Other employees work in UNESCO field offices.

The Director-General is appointed to a six-year term. He appoints and directs the staff of the Secretariat and makes regular reports to member nations and the Executive Board on UNESCO activities. He submits work plans and budget estimates to the Executive Board. Sir Julian Huxley of Great Britain, the first Director-General, served from 1946 to 1948. Jaime Torres Bodet of Mexico succeeded him, serving until 1952. Luther H. Evans of the United States held the post from 1953 to 1958. He was succeeded by Vittorino Veronese of Italy, who was succeeded in 1961 by René Maheu of France. Maheu was elected Director-General again in 1968.

The National Commissions of the member nations advise their governments. They also assist the delegations to the General Conference. They provide information and help coordinate activities. Most member nations have national commissions to UNESCO. Most commission members come from national organizations interested in education, science, and culture.

History

After World War I (1914-1918), most of the Allies joined in an international association called the League of Nations (see LEAGUE OF NATIONS). The League recognized the importance of promoting intellectual cooperation among nations. In 1921, it organized the International Institute of Intellectual Cooperation. This committee later founded affiliated national groups in 50 countries.

During World War II (1939-1945), ministers of education of the Allied nations held conferences regularly. They met to consider problems of education. They were especially concerned with reviving educational systems that had been weakened or destroyed by the war.

The United Nations Charter was signed in San Francisco in June, 1945. In November of that year, the United Nations Conference for the Establishment of an Educational and Cultural Organization met in London. Representatives of 44 countries attended. They drew up the Constitution of UNESCO, and UNESCO officially came into existence on Nov. 4, 1946. By that date, 20 member countries had ratified the Constitution.

The UNESCO General Conference session of 1954 became an important milestone. The conference set up five important problems on which UNESCO should concentrate. These problems were: (1) illiteracy; (2) primary education; (3) racial, social, and international tensions; (4) mutual appreciation of Eastern and Western cultures; and (5) research on living conditions.

During the 1960's, UNESCO promoted international cooperation in solving world problems. It also gave much attention to the problems of the developing nations. UNESCO's 1968 General Conference stressed conservation of the world's resources. L. A. MINNICH, JR.

See also UNITED NATIONS; LIBRARY (International Library Programs).

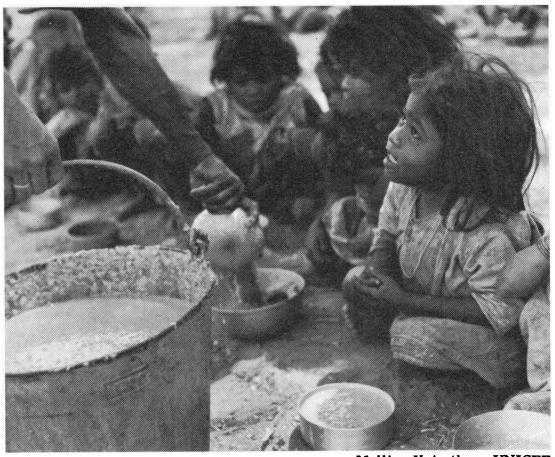
UNGAVA. All the peninsula of Labrador, except for a narrow strip along the eastern coast, was once included in the district of Ungava, which covered about 351,800 square miles (911,160 square kilometers). In 1912, Ungava became part of the province of Quebec.

UNGRADED SCHOOL. See EDUCATION (Elementary); EDUCATIONAL PSYCHOLOGY (Teaching Methods).

UNGULATE, *UNG gyoo layt*, is any mammal whose toes end in hoofs. The name comes from the Latin word *ungula*, meaning *hoof*. Scientists divide ungulates into two groups. *Odd-toed ungulates* include horses, which have one toe on each foot, and rhinoceroses, with three. *Even-toed ungulates* include deer, with two toes per foot, and pigs, with four. Ungulates are the only horned mammals, but not all ungulates have horns. All are *herbivores* (animals that eat chiefly plants). Elephants, the largest land animals, are ungulates. WILLIAM V. MAYER

Related Articles in WORLD BOOK include:

Alpaca	Caribou	Herbivore	Musk Ox
Antelope	Cashmere Goat	Hippopotamus	Okapi
Babirussa	Cattle	Hog	Peccary
Bighorn	Deer	Hoof	Rhinoceros
Boar, Wild	Dromedary	Horn	Ruminant
Brahman	Elephant	Horse	Sheep
Buffalo	Giraffe	Ibex	Vicuña
Camel	Goat	Karakul	Wart Hog
Carabao	Guanaco	Llama	Yak



Mallica Vajrathon, UNICEF

UNICEF Programs aid children in more than 100 countries. These youngsters are receiving UNICEF food at a school in India.

UNICAMERAL LEGISLATURE. See LEGISLATURE; NEBRASKA (Legislature).

UNICEF is the commonly used name for the UNITED NATIONS CHILDREN'S FUND. The name comes from the original title of this UN agency—United Nations International Children's Emergency Fund. UNICEF aids children in more than 100 countries by helping to solve problems of health, hunger, and education. UNICEF provides supplies for disease-control programs, day-care centers, health centers, school food plans, milk stations, and other projects. It also gives money to help train people for such jobs as nursing and teaching. In 1965, it received the Nobel peace prize for its work.

When UNICEF was created in 1946, it gave food, clothing, blankets, and medicine to children who needed help after World War II. Following this work, it continued to give aid to children of developing nations.

The people and governments of many countries donate the money used by UNICEF. Some people help by buying UNICEF greeting cards. On Halloween, many children "trick or treat" for UNICEF. C. LLOYD BAILEY

UNICORN, *YOO nuh kawrn,* was a strange animal described in ancient Greek and Roman myths. It was said to look much like a horse, except that on its forehead it had a single straight horn with a spiral twist. Its name means *one-horn.* The horn was white at the base, black in the middle, and red at the tip. The unicorn had a white body, a red head, and blue eyes. Its hind legs were like an antelope's, and its tail was like a lion's. Artists of the Middle Ages placed a unicorn beside figures of Christ, the Virgin Mary, and virgin saints, as a sign of purity. The word *unicorn* appeared in early Bibles, but this usage is now translated as *wild ox.* See also TAPESTRY (picture). NATHAN DANE II

The Unicorn is often used in the design on a coat of arms.

UNIDENTIFIED FLYING OBJECT (UFO) is a strange light or object that appears in the sky or near the ground and has no known cause. Some people believe UFO's may be spaceships from other planets. Others think UFO's have natural causes, even though scientists cannot explain all UFO reports.

Observers have described various kinds of UFO's. Many of these objects resemble a glowing tube or saucer and fly at high speeds, either silently or with a whining sound. UFO's have been reported to have frightened animals, caused static on radios, and landed and left marks on the ground.

For hundreds of years, people have reported seeing mysterious objects in the sky. During World War II (1939-1945), the number of such reports increased greatly. Many military and civilian pilots reported seeing strange moving lights that they called *foo-fighters.* Other reports, some of so-called *flying saucers,* occurred during the mid-1900's in the United States and in other countries. Many of these reports came from reliable observers, some of whom photographed what they saw.

Scientists have provided logical explanations for many UFO reports. For example, in many cases, a reported UFO later was identified as a meteor, a planet, a rocket, a star, an artificial satellite, or a weather balloon. Aircraft or their exhaust trails, seen under unusual lighting conditions, have also been reported as UFO's. In addition, atmospheric conditions may produce optical illusions that are described as UFO's.

From 1966 to 1968, the U.S. Air Force sponsored a study of UFO's by scientists at the University of Colorado. The scientists could not explain all the UFO reports, but they found no evidence that UFO's came from other planets. The Air Force also investigated more than 12,000 UFO reports that occurred from 1947 to 1969. It ended the investigation after concluding that UFO's were no threat to national security. In 1973, a group of scientists established the Center for UFO Studies, which gathers and examines information about UFO reports. The address of the center is P. O. Box 11, Northfield, Ill. 60093. J. ALLEN HYNEK

UNIFORM is a style of clothing that identifies persons as members of a group or as workers in a particular field. The most renowned uniforms are the military uniforms.

United States Air Force. In winter, officers and men wear light blue trousers, light blue coats with silver buttons, and visor caps. They wear blue shirts, black ties, and black shoes. In summer, they wear cotton khaki shirts and trousers. Women wear two-piece wool uniforms in winter and cotton dresses in summer.

United States Army. In winter, men wear light tan shirts with dark green coats and trousers and black ties and shoes. The single-breasted coats have four large gold buttons. Officers' uniforms have black braid on the trousers and coat cuffs. In summer, men wear cotton khaki shirts and trousers. There is narrow braid on the cuffs of officers' coats. Officers wear green visor caps with gold trim. Enlisted men wear visor or overseas caps. Women wear green cotton two-piece summer uniforms and visor or overseas caps.

United States Marine Corps uniforms are of forest-green wool in winter and khaki in summer. For dress

occasions, the marines wear dark blue jackets with gold buttons, light blue trousers with scarlet stripes, and white caps and belts. Women in the Marine Corps wear wool suits in winter and cotton suits in summer.

United States Navy. For dress occasions, Navy officers and enlisted men wear a dark blue double-breasted suit, which comes in both winter and summer weights. They also wear a white shirt, a white visor cap, a black tie, and black shoes. Officers wear gold buttons, a gold sleeve braid, and a gold hat insignia. Enlisted men wear silver buttons and a silver hat insignia. The enlisted men's traditional blue jumpers and round white hats were scheduled to be replaced gradually by 1976.

Women in the Navy wear navy blue wool gabardine suits in winter, and gray and white seersucker dresses in summer. They may wear either overseas caps or soft-brim hats with high crowns. THOMAS E. GRIESS

For pictures of uniforms, see AIR FORCE, UNITED STATES; ARMY, UNITED STATES; MARINE CORPS, UNITED STATES; NAVY, UNITED STATES.

UNIFORM CODE OF MILITARY JUSTICE is a set of laws that governs the conduct of all members of the United States armed forces. It also establishes a system of military courts and judges to try servicemen accused of violating these regulations.

The code provides for three types of military courts and specifies the crimes that each may try. A *general court-martial* may try any military crime, including those punishable by death. A *special court-martial* tries less serious crimes. A *summary court-martial* tries minor offenses.

The code states that a qualified lawyer must be offered to a defendant in any general or special court-martial. The defendant may refuse to have a lawyer, except in cases involving a bad conduct discharge. A defendant may request a trial by a military judge alone, rather than by a court-martial. The code also states that a defendant may be released from confinement while awaiting an appeal of his case. Congress established the code in 1950 and revised it in the Military Justice Act of 1968. FREDERICK C. LOUGH

See also COURT-MARTIAL.

UNIFORM PARTNERSHIP ACT. See PARTNERSHIP.

UNIFORM SMALL LOAN LAW. See LOAN COMPANY.

UNILEVER is one of the largest industrial corporations in the world. It consists of two holding companies that have the same management. *Unilever Limited* has headquarters in London. *Unilever N.V.* has headquarters in Rotterdam. Unilever controls more than 500 companies and subsidiaries in over 50 countries. These companies manufacture oils, fats, soaps, detergents, foodstuffs, prepared foods, and other commodities. Unilever was organized in 1929. For sales, assets, and number of employees, see MANUFACTURING (table: 25 Leading Manufacturers). Critically reviewed by LEVER BROTHERS CO.

See also LEVERHULME, VISCOUNT.

UNION. See LABOR; FLAG (Terms); SET THEORY.

UNION, ACT OF, in Canadian history, united the provinces of Upper and Lower Canada. The Parliament of Great Britain passed the act in 1840. The British government had set up the two provinces in 1791 to please a group of British colonists called United Empire Loyalists (see UNITED EMPIRE LOYALIST). The creation of two provinces was also intended to please the French-speaking majority in Lower Canada.

The Act of Union of 1840 provided for one governor of the two provinces, and a legislative council of at least 20 members appointed by him. The people of each province elected 42 members to a legislative assembly, which met at least once a year. Its members held office for four years, unless the governor dissolved the assembly. The act also made English the only official language in council and assembly meetings. In 1848, however, French was made the second official language. The act led to more responsible government. See CANADA, HISTORY OF (Lord Durham's Report).

Act of Union also refers to three other important acts in the history of Great Britain. The first act united England and Wales in 1536. The second act joined England and Scotland as the United Kingdom of Great Britain in 1707. The third, which made Ireland part of the United Kingdom, was passed in 1800 and went into effect in 1801. For a more detailed description of these events, see WALES (Union); GREAT BRITAIN (History); SCOTLAND (Union). JEAN BRUCHÉSI

UNION CARBIDE CORPORATION is one of the world's leading producers of synthetic organic chemicals and plastics, atmospheric gases, alloys and metals, and carbon and graphite products. Its products and processes are important to every branch of industry, and to the United States atomic energy and space programs.

The corporation produces a wide variety of products, including aerosol propellants, batteries, carbon textiles, fumigants, liquid hydrogen, industrial solvents, rock-piercing equipment, synthetic gems, and uranium compounds. Union Carbide trade names include *Prestone*, *Eveready*, and *6-12*.

The Union Carbide Corporation was formed in 1917. The corporation has about 360 plants in the United States and Canada. It also has about 50 associated companies doing business in over 100 countries. The corporation operates a plant for refining uranium at Oak Ridge, Tenn. Headquarters are at 270 Park Avenue, New York, N.Y. 10017. For chemical sales and total sales of Union Carbide Corporation, see CHEMICAL INDUSTRY (table: Leading U.S. Companies in Chemical Sales). Critically reviewed by UNION CARBIDE CORPORATION

UNION CITY, N.J. (pop. 57,305), is a manufacturing and residential center just north of Jersey City. The Lincoln Tunnel under the Hudson River links Union City with New York City. For location, see NEW JERSEY (political map).

Union City manufactures clothing and automotive, chemical, electrical, heating, paper, tobacco, and wood products. The city was formed in 1925 through a consolidation of Union and West Hoboken. Union City has a commission form of government. RICHARD P. MCCORMICK

UNION JACK is the name sometimes used for the national flag of Great Britain, officially called the British Union Flag. The United States Jack has been called a union jack. See also FLAG (Navy Flags).

UNION LABEL is the trademark of organized labor. The label is placed on a finished product to show that members of the union manufactured it. Union labels are registered as trademarks. The purpose of the label is to encourage the use of union-made products. The union label was first used in California during the 1870's. During this time, many Chinese who were

willing to work for low wages entered the United States. The unions protested, and used labels to mark their work. ROBERT D. PATTON

UNION LEAGUE. See RECONSTRUCTION (Scalawags and Carpetbaggers).

UNION OF SOUTH AFRICA. See SOUTH AFRICA (The Union of South Africa).

UNION OF SOVIET SOCIALIST REPUBLICS. See RUSSIA.

UNION PACIFIC RAILROAD. See CREDIT MOBILIER OF AMERICA; HARRIMAN (Edward); WESTERN FRONTIER LIFE (East Meets West).

UNION PARTY. See REPUBLICAN PARTY (The Civil War).

UNION SHOP is a form of security given to a union in a collective-bargaining agreement. An employer formally recognizes a union as the sole bargaining agent for a specific group of employees. All these employees must belong to the union, or must join it within a specified period, usually 30 or 60 days following the signing of the contract or of their employment, whichever is later. Usually they must remain members of the union as long as the contract or its union shop provision lasts, or they will lose their jobs. GERALD G. SOMERS

See also CLOSED SHOP; OPEN SHOP.

UNION STOCKYARDS. See CHICAGO (Industry).

UNION THEOLOGICAL SEMINARY is a coeducational graduate school of religion in New York City. It has cooperative programs with Columbia University and the Jewish Theological Seminary of America. Degrees are given in theology, religious education, and sacred music. The seminary, founded in 1836, admits Protestant, Roman Catholic, and Jewish students who wish to prepare for religious work. For the enrollment of Union Theological Seminary, see UNIVERSITIES AND COLLEGES (table). EDWIN OLIVER KENNEDY

UNIONS, LABOR. See LABOR.

UNIREME. See GALLEY.

UNIROYAL, INC. See RUBBER (Leading Rubber Manufacturers).

UNIT, in measurement, is a quantity adopted as the standard by which any other quantity of the same kind is measured. The standard units of measure used in science, commerce, and industry have been tabulated in groups called *tables of denominate numbers.* There are units of money, of time, of surface, of volume, of weight, and of many other things. PHILIP FRANKLIN

See also DENOMINATE NUMBER; MEASUREMENT; METRIC SYSTEM; WEIGHTS AND MEASURES.

UNIT RULE, in the United States, was a voting rule permitted by the Democratic Party at its presidential nominating conventions from 1860 until 1968. The rule permitted the entire vote of a state delegation to be cast for one candidate, even though a minority of the delegation members favored another candidate. The national convention did not require the unit rule, but it enforced state instructions to delegates to vote as a unit. The rule was abolished at the 1968 Democratic National Convention. The Republican Party has never used the unit rule. ROBERT A. DAHL

UNITARIAN UNIVERSALIST ASSOCIATION is a religious denomination formed in 1961 to consolidate the American Unitarian Association and the Universalist Church of America. The association's members are local, self-governing congregations and fellowships. It is organized under a Board of Trustees chosen by a General Assembly. A president and continental staff work in the national headquarters in Boston.

This denomination developed from protests against the doctrine of the Trinity as held by orthodox Christians, and it supports complete freedom of belief by its members. Hosea Ballou started the Universalist movement in the United States. William Ellery Channing was the founder of Unitarianism. The denomination is historically centered in New England, especially Boston, and has recently spread to urban areas across the United States and Canada. The association is also affiliated with similar groups in Europe and Asia. For more information on the movement, see UNITARIANS. For the membership, see RELIGION (table).

Critically reviewed by the UNITARIAN UNIVERSALIST ASSOCIATION

UNITARIANS believe in the unity of God, rather than in the doctrine of the Trinity as found in the historic creeds of the Christian church. The term *Unitarians* also extends to religious groups dating from the 1500's to the present who rejected not only the doctrine of the Trinity, but also creeds as the basis for authority in religion.

History. Early spokesmen for Unitarianism on the continent of Europe were Francis David (1510-1579) in Transylvania, then part of Hungary; and Faustus Socinus (1539-1604), leader of the Minor Reformed Church in Poland. In England, Unitarian views were advanced by John Biddle (1615-1662). But the main development of English Unitarianism came during the 1700's, when many churches that had previously been Presbyterian became Unitarian. The British and Foreign Unitarian Association was formed in 1825.

In America, Unitarianism developed during the 1700's within the congregational churches in New England. The movement reacted against Calvinistic doctrines that emphasized human sinfulness, as well as the Trinity. Unitarians argued that such doctrines were inconsistent with the Bible and contrary to reason.

The dispute in the United States between the liberals (Unitarians) and the orthodox Congregationalists became so bitter after 1805 that many churches divided. The Unitarians were forced to organize as a separate religious body. The most prominent spokesman for the Unitarians during this period was a Boston clergyman named William Ellery Channing. His sermon "Unitarian Christianity" (1819) was widely accepted as a good statement of their position. The American Unitarian Association was organized in 1825.

Channing believed in Christianity as a divinely inspired religion proved by the miracles of Jesus. Younger Unitarian ministers soon began to argue that religious truth should be based on universal religious experiences, rather than on the record of historical events of long ago. They believed that religious truth and inspiration could be found in traditions other than Christianity.

Such ideas were expressed by Ralph Waldo Emerson in his "Divinity School Address" (1838), and by Theodore Parker in his sermon "The Transient and Permanent in Christianity" (1841). These addresses expressed a new point of view in philosophy and religion. This view was called *transcendentalism* because it stated that men may have an experience of reality that *transcends* (goes beyond) the experience of the senses.

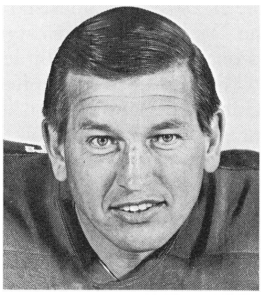
Transcendentalism had a lasting effect on Unitarianism, especially in making it more receptive to religious ideas drawn from non-Christian sources. Since that time, two views have emerged in the denomination. One emphasizes liberal religion strongly attached to the Christian tradition. The other refuses to accept any such limits, and often argues that the modern mind, under the impact of science, has moved beyond Christianity altogether. See TRANSCENDENTALISM.

Organization. In 1865, the Unitarian churches in the United States founded a national conference. In 1925, this organization was absorbed into the American Unitarian Association. In 1961, the American Unitarian Association merged with the Universalist Church of America to form a new religious body, the Unitarian Universalist Association. This merger brought together two groups with parallel histories and a similar outlook. The denomination is organized on the basis of congregational church government. That is, the local church exerts basic authority. The local church strongly emphasizes individual freedom of belief and democratic participation in church affairs. Regional and national organizations provide leadership and services for the local churches, but they do not control the churches.

Unitarianism's original area of strength was New England. Today, Unitarian Universalist churches are found in many other parts of the United States and Canada. Most of these churches are in urban areas, and many are in university communities. CONRAD WRIGHT

See also UNITARIAN UNIVERSALIST ASSOCIATION; CHANNING, WILLIAM E.; EMERSON, RALPH WALDO.

UNITAS, JOHN (1933-), became one of the greatest quarterbacks in professional football. He completed more passes and gained more yards passing than any other quarterback in National Football League history.



Baltimore Colts

John Unitas

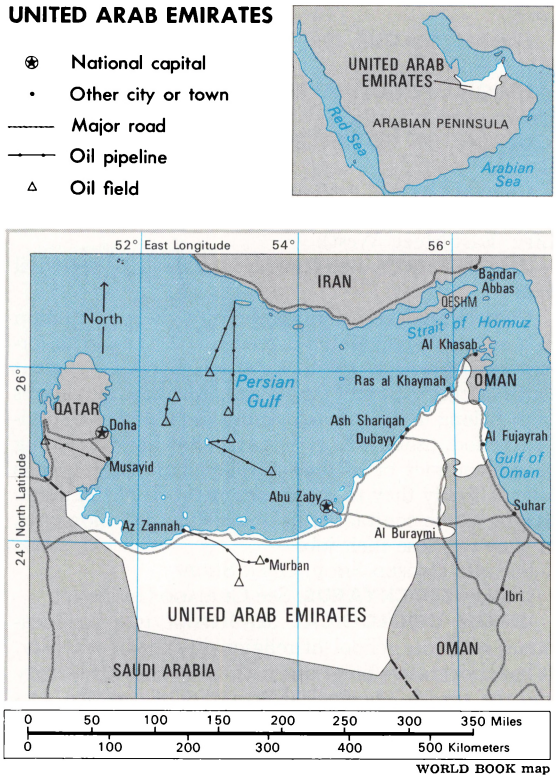
Unitas played for the Baltimore Colts from 1956 through the 1972-1973 season. He led the Colts to three world championships —in 1958 and 1959, and again in the 1970-1971 season. Unitas became noted for his daring selection of plays and his passing accuracy. He threw at least one scoring pass in 47 straight league games. In 1959, he threw 32 touchdown passes in 12 games.

Unitas was born in Pittsburgh, and he graduated from the University of Louisville. He joined the Pittsburgh Steelers in 1955, but was released before the season began. He then played with a semiprofessional team before joining the Baltimore Colts. Unitas played for the San Diego Chargers in 1973 and retired as a player in 1974. HERMAN WEISKOPF

UNITED. Many organizations beginning with the word *United* are listed in THE WORLD BOOK ENCYCLOPEDIA under the key word in the name of the organization. Example: STEELWORKERS OF AMERICA, UNITED.

UNITED AIR LINES. See AIRLINE (Major Airlines).

UNITED ARAB EMIRATES



WORLD BOOK map

UNITED ARAB EMIRATES is a federation of seven independent Arab states in southwestern Asia. These states lie along the eastern coast of the Arabian Peninsula, at the south end of the Persian Gulf. They are Abu Zaby, Al Fujayrah, Ash Shariqah, Dubayy, Ras al Khaymah, Ujman, and Umm al Qaywayn. Each state has a city or town of that same name.

Most of the people of the United Arab Emirates (UAE) are Arab Moslems. Almost three-fifths of them live in urban areas. The city of Abu Zaby is the federation's capital. Dubayy, the largest city, ranks as a leading Persian Gulf port and commercial center.

Beginning in the early 1800's, Great Britain gradually took control of the states' defense and foreign affairs. The states became known as the Trucial States. They remained under British protection until 1971, when they gained full independence. That year, six of the states joined together and formed the United Arab Emirates. Ras al Khaymah joined the union in 1972.

Before the mid-1900's, the region that is now the United Arab Emirates was one of the most underdeveloped in the world. Most of the people earned a living as farmers, fishermen, traders, or nomadic herders. The discovery of oil during the late 1950's brought sudden wealth to the region and led to the development of mod-

Robert Geran Landen, the contributor of this article, is Dean of the College of Social and Behavioral Sciences at the University of South Carolina and the author of The Emergence of the Modern Middle East.

ern cities and towns. Many of the people left their traditional ways of life and took jobs in the oil industry and other fields. By the 1970's, the UAE had one of the highest *per capita* (per person) incomes in the world.

Government. A ruler called an *emir* governs each of the seven states, called *emirates*, that make up the UAE. Each emir controls his state's internal affairs.

The federal government controls the UAE's foreign affairs. The seven emirs form the Supreme Council of the United Arab Emirates. The council appoints a president, who serves as chief of state, and a prime minister, who heads the government. The prime minister has a cabinet, the members of which supervise various federal *ministries* (departments). Each emir appoints representatives to the federal legislature, called the Consultative Assembly.

People. Most of the people of the UAE belong to a number of Arab tribes that have lived in the region for hundreds of years. Each tribe has its own traditions. Rivalries among the various tribes have made it difficult to establish a unified nation.

Since the 1960's, thousands of people from neighboring Arab countries and from India, Iran, and Pakistan have come to the UAE to work in the oil industry. The rapid increase in population has caused housing shortages and other problems. But money from the oil industry has enabled the UAE to build apartment buildings, schools, hospitals, and roads to meet the needs of the growing population.

The cities and towns of the UAE have modern houses and apartment buildings. But in rural areas and on the outskirts of the cities, many people live in small

FACTS IN BRIEF

Capital: Abu Zaby.

Official Language: Arabic.

Form of Government: Federation.

Area: 32,000 sq. mi. (82,880 km²). *Greatest Distances*—north-south, 250 mi. (402 km); east-west, 350 mi. (563 km). *Coastline*—483 mi. (777 km).

Elevation: *Highest*—Jabal Yibir, 5,010 ft. (1,527 m) above sea level. *Lowest*—Salamiyah, a salt flat slightly below sea level.

Population: *Estimated 1976 Population*—228,000; distribution, 57 per cent urban, 43 per cent rural; density, 8 persons per sq. mi. (3 per km²). *1968 Census*—179,126. *Estimated 1981 Population*—265,000.

Chief Products: *Agriculture*—dates. *Fishing*—fish, shrimp. *Mining*—petroleum.

Flag: The flag has a vertical red stripe and horizontal stripes of green, white, and black. It was adopted in 1971. See FLAG (color picture: Flags of Asia and the Pacific).

Money: *Basic Unit*—dirham. One hundred fils equal one dirham. See MONEY (table: Values).

Bruno Barbey, Magnum

Pedestrians and Automobiles Jam a Crowded Street in Dubayy, the largest city of the United Arab Emirates. Dubayy, an important Middle Eastern port, serves as a commercial center. The city has expanded rapidly since the 1960's, when oil production began in the country.

thatched huts, much as their ancestors did hundreds of years ago. Some of the people wear Western clothing, but most prefer traditional Arab garments.

Arabic is the official language of the UAE. About a fifth of the population can read and write. In the late 1950's, the states had only 8 schools. By the early 1970's, they had a total of about 55 elementary and high schools. The government of Kuwait built many of the schools in the UAE.

Land and Climate. The United Arab Emirates covers about 32,000 square miles (82,880 square kilometers), including a number of offshore islands in the Persian Gulf. Swamps and salt marshes line much of the country's northern coast. A sandy desert occupies most of the inland area. Water wells and oases dot the desert regions. The largest oasis, Al Buraymi, lies in both the UAE and in Oman, the country's neighbor to the east. Hills and rugged mountains cover much of the eastern part of the UAE.

The UAE has a hot climate with little rainfall. The humidity is often high along the coast, but the inland desert regions are dry. The mountainous areas are generally cooler and receive more rainfall than the rest of the country. Summer temperatures in the UAE average more than 90° F. (32° C) and often reach 120° F. (49° C). In winter, temperatures seldom drop below 60° F. (16° C). The country receives an average of less than 5 inches (13 centimeters) of rain a year.

Economy of the United Arab Emirates depends largely on the production and export of oil. Oil production takes place in the states of Abu Zaby and Dubayy, which have the largest known oil deposits. American, European, and Japanese companies operate the oil industry. They pay taxes and *royalties* (shares of their profits) to the rulers of Abu Zaby and Dubayy. The UAE does not have its own oil refinery. Tankers carry crude oil from the UAE to refineries in other countries. Construction of a refinery in the United Arab Emirates was expected to begin during the mid-1970's.

Only about 5 per cent of the land of the UAE is suitable for raising crops. Farmers in the desert oases and the hilly regions of the eastern UAE grow bananas, citrus fruits, dates, and other crops. Some farmers also raise cattle. Desert nomads tend herds of camels, goats, and sheep. In the coastal areas, fishermen catch fish, shrimp, and other seafoods.

Abu Zaby and Dubayy are the chief ports of the UAE. In addition to oil, the country exports small amounts of dates and fish. Leading imports include building supplies, clothing, food products, household goods, and machinery.

Roads link the major cities and towns of the United Arab Emirates. The country has three international airports. Several of the states operate radio stations, and Abu Zaby and Dubayy have television stations.

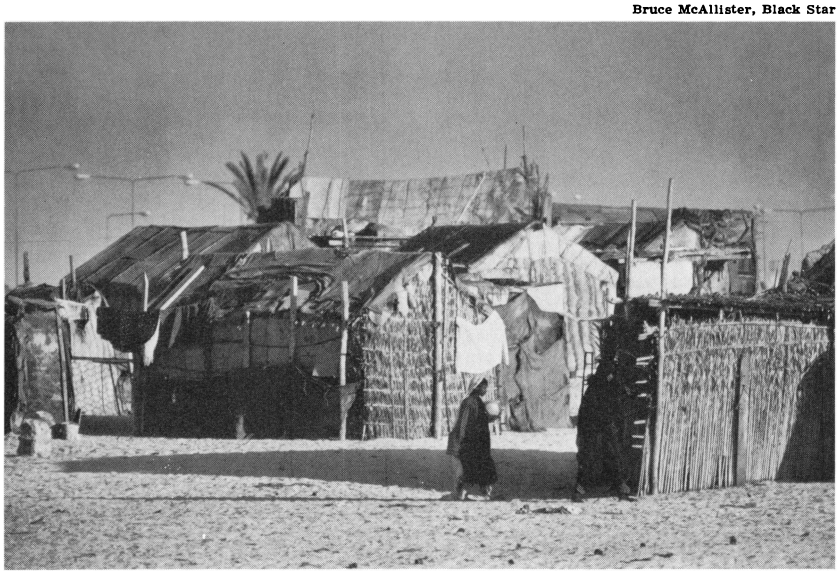
History. People have lived in the region that is now the UAE for thousands of years. Arab tribal chiefs gradually established control over the region. Most of the people became Moslems during the A.D. 600's.

The states on the Persian Gulf coast lay along a major trade route between Europe and East Asia. Beginning in the 1500's, various European nations established trading posts in the region. They competed with Arabs, Persians, and Turks for control of the gulf trade. In time, Britain became the strongest European power in the gulf. British ships passed through the gulf on their way to and from British settlements in India.

Battles between British ships and those of the local Arabs occurred frequently during the late 1700's and early 1800's. In 1820, after a British attack on Ras al Khaymah, the Arab rulers of the gulf states signed a treaty with Britain to prevent warfare at sea. The British and the Arab chiefs signed various other agreements during the 1800's and early 1900's, and the region became known as the Trucial States. In time, Britain took control of the states' defense and foreign affairs. But the tribal rulers continued to handle internal matters. Traditional rivalries—and disputes over boundaries, fishing rights, and other matters—led to wars among the tribes during the 1800's and early 1900's.

The Trucial States remained underdeveloped until the mid-1900's, when foreign oil companies began to

Bruce McAllister, Black Star



Small Thatched Huts house hundreds of families on the outskirts of cities in the United Arab Emirates. Many of these people are former desert nomads who now work in the cities.

drill for oil in the region. In 1958, oil was discovered in the state of Abu Zaby. Abu Zaby began to export crude oil in 1962. Four years later, large oil deposits were found in Dubayy. Money from oil production enabled Abu Zaby and Dubayy to begin to develop into modern states. But the other states continued to rely on agriculture and fishing as the basis of their economy.

In 1971, the Trucial States gained full independence from Britain. In spite of traditional rivalries, all the states except Ras al Khaymah joined together and formed the United Arab Emirates on Dec. 2, 1971. That same year, the UAE became a member of the Arab League and the United Nations. Ras al Khaymah joined the UAE in February, 1972.

Under the Provisional Constitution adopted by the UAE in 1971, each emir continued to handle the internal affairs of his state. But the rulers agreed to share their resources and work for the economic development of all the states. ROBERT GERAN LANDEN

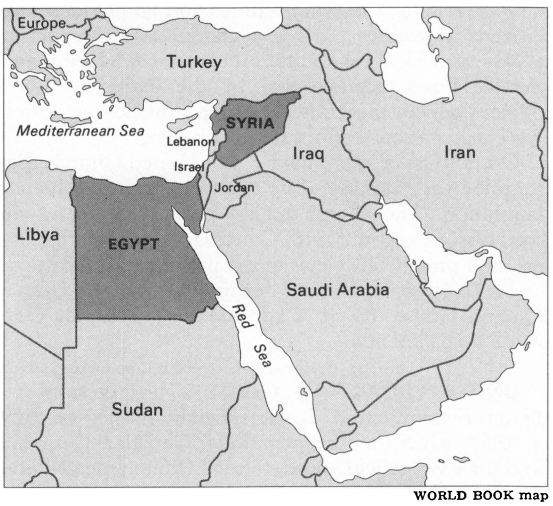
See also ABU ZABY.

UNITED ARAB REPUBLIC (U.A.R.) was a union of two independent Middle Eastern countries, Egypt and Syria. President Gamal Abdel Nasser of Egypt and Shukri al-Kuwatly of Syria proclaimed the union on Feb. 1, 1958. Syrian rebels ended it on Sept. 29, 1961, setting up an independent government for Syria. Egypt continued to use the name United Arab Republic until 1971, when the country changed its official name to the Arab Republic of Egypt.

In April, 1963, Egypt, Syria, and Iraq agreed to form a new U.A.R. But later that year, the three nations postponed the proposed federation until they could resolve political differences.

Government. The U.A.R. of 1958 had a centralized government, with Cairo as the capital. Egypt and Syria became provinces, with provincial capitals at Cairo for Egypt and Damascus for Syria.

Soon after the merger, the people adopted a provisional constitution and chose Nasser as president. He appointed all members of the National Assembly, selecting half from Egypt and half from Syria. The assembly supposedly exercised legislative power, but Nasser made many decisions without consulting it.



WORLD BOOK map

Location of the United Arab Republic

United Press Int.

The United Arab Republic was formed in 1958 by merging Egypt and Syria. Egyptian President Nasser became president.

History. Before World War I, most of the Middle East was part of the Ottoman Empire. However, Great Britain had gained control of Egypt in the 1880's, and kept it until Egypt became independent in 1922. After World War I, the Middle East was carved into a number of political divisions. Syria, along with Lebanon, became a League of Nations mandate of France, which controlled them until after World War II.

Following the war, many Arabs wanted to be united under a single government. Nasser came into power in Egypt during the 1950's, and became the leader of Arab nationalism. Many Arab leaders suspected the West and turned to Russia for assistance. Nasser accepted Russian aid, although he suppressed Communism within Egypt. The Communists also gained great power in Syria. Arab nationalism, the fear of Communist influence in Syria, and Nasser's ambition all contributed to the formation of the United Arab Republic.

Nasser regarded the union of Egypt and Syria as the first step toward uniting all Arab states. On March 8, 1958, Yemen—now Yemen (Sana)—agreed to form a federation with the U.A.R. The union was called the United Arab States, and had Hodeida (now Al Hudaydah), Yemen, as its permanent seat. The United Arab States was not a true federation. Yemen maintained its own membership in the United Nations and separate relations with other countries. Nasser dissolved the United Arab States in December, 1961. He declared that the federation was no longer of any value.

Nasser made clear that the U.A.R. would be neutral in world affairs. In 1959, he accused Russia of trying to interfere with the internal affairs of the republic. At the same time, he improved relations with the West.

The government introduced many reforms in both provinces. But many Syrians began to feel that Nasser was raising the level of living in Egypt only by lowering it in Syria. Finally, late in 1961, Syrian officers in the U.A.R. army carried out an almost bloodless revolt and proclaimed an independent Syria. The Baath Party, the ruling party in Syria and Iraq, blocked a new federation attempt in 1963. The party opposed Nasser's attempt to control the new U.A.R. CHARLES P. SCHLEICHER

See also EGYPT; IRAQ; NASSER, GAMAL ABDEL; SYRIA; YEMEN (SANA).

UNITED ARAB STATES. See UNITED ARAB REPUBLIC.

UNITED AUTOMOBILE WORKERS (UAW) is one of the largest labor unions in the United States. The UAW has local unions throughout both the United States and Canada. Its official name is INTERNATIONAL UNION, UNITED AUTOMOBILE, AEROSPACE AND AGRICULTURAL IMPLEMENT WORKERS OF AMERICA.

To qualify as a member, a worker must be employed in the manufacture or assembly of automobiles, automobile parts or accessories, aircraft, aerospace products, agricultural implements, electrical, or other allied metalworking trades. Office workers and such salaried employees as draftsmen and engineers in the same field also may become members of the UAW.

The union was organized in Detroit in 1935. It took the place of the National Council of Automobile Workers, which had been affiliated with the American Federation of Labor (AFL). In 1938, the federation expelled the union, along with the other AFL international unions that had made up the Committee for Industrial Organization. The UAW later helped develop the Congress of Industrial Organizations (CIO), which merged with the AFL in 1955. The UAW withdrew from the AFL-CIO in 1968. It maintains headquarters at 8000 E. Jefferson Ave., Detroit, Mich. 48214. For information on membership, see LABOR (table).

Critically reviewed by the UNITED AUTOMOBILE WORKERS

See also REUTHER, WALTER P.; WOODCOCK, LEONARD.

UNITED CHURCH OF CANADA is the largest Protestant church in Canada. It was established in 1925 by the union of the Methodist Church in Canada with most Canadian Congregationalist and Presbyterian congregations. A fourth denomination, the Canada Conference of the Evangelical United Brethren Church, joined the union in 1968. The United Church had about a million members in the mid-1970's.

Doctrine and Organization. In 1924, the Canadian Parliament passed the United Church of Canada Act. This act, which became effective on June 10, 1925, formally established the United Church.

A constitution called the *Basis of Union* sets forth the administration, legal procedures, and organization of the United Church. The Basis of Union also includes 20 *Articles of Faith* that state the church's doctrine. This doctrine is based on the Bible.

The United Church is organized regionally in areas called, from smallest to largest, congregations, presbyteries, and conferences. A General Council, which meets every two years, has considerable authority over the entire church.

The United Church has a presbyterian form of government—that is, the clergy and laymen share equal responsibility for church administration. The presbyteries, conferences, and General Council are all governed by bodies made up equally of clergy and laymen. All clergy of the United Church are called ministers and have equal rank. Both men and women may be ordained as ministers.

Since the 1960's, the Anglican Church and the Christian Church (Disciples of Christ) in Canada have been negotiating with the United Church concerning union. In 1975, the Anglican Church rejected a "plan of union" prepared by representatives of the three denominations. However, the Anglicans expressed interest in continuing discussions and joint projects.

Duo-Craft Studios, Toronto

The United Church of Canada has headquarters in the United Church House, which is located in Toronto, Ont.

Activities and Services. The United Church operates several colleges and theological schools that are part of Canadian universities. The church produces much of its own educational material and publishes a periodical called the *United Church Observer*.

The United Church has four training centers that prepare laymen for leadership positions in the church. The United Church and the Anglican Church jointly operate a training center for unordained professional church workers.

In addition to its educational activities, the United Church manages several hospitals and homes for senior citizens in various parts of Canada. It also sponsors a variety of local rehabilitation centers. A Mission and Service Fund, administered by the national church office, finances the United Church's mission activities. All congregations contribute to this fund.

On matters of social justice, the United Church tries to guide the thinking of its members and to influence legislation. The church makes public statements on social issues, consults with Canadian government leaders, and presents its views to the provincial legislatures.

The United Church has headquarters at The United Church House, 85 St. Clair Ave. E., Toronto, Ont. M4T 1M8, Canada.

Critically reviewed by the UNITED CHURCH OF CANADA

UNITED CHURCH OF CHRIST is a Protestant religious denomination. It was officially formed on July 4, 1961, when the Congregational Christian Churches and the Evangelical and Reformed Church merged and declared a constitution in force.

The United Church of Christ has a *general synod*

(central committee) that directs business affairs, nominates church officials, and performs other duties related to church operations. But individual congregations have the right to govern themselves.

The Congregational movement in the United States dates from the time of the Pilgrims, who landed in America in 1620. In 1931, the Congregational churches merged with a union of three small groups that all used the name Christian. The Evangelical and Reformed Church was formed in 1934 by the union of two American churches of German background.

Church headquarters are at 297 Park Avenue South, New York, N.Y. 10010. For membership in the United States, see RELIGION (table). BEN M. HERBSTER

UNITED COLONIES OF NEW ENGLAND. See NEW ENGLAND CONFEDERATION.

UNITED EMPIRE LOYALIST. Many British colonists in America refused to take up arms against Great Britain in the Revolutionary War in 1775. Between 40,000 and 60,000 of these persons went to Canada. They were known as United Empire Loyalists.

The Loyalists suffered persecutions in the United States from 1775 to 1783. Most of them left the country in 1783 and 1784. Some settled in Nova Scotia and Quebec. Others helped found New Brunswick and Ontario. They soon became the most important single group in Canada, politically and economically.

Many of the Loyalists were among the wealthy people of the 13 colonies. But they left their homes for the sake of their political beliefs. Others left because they hoped to obtain valuable land. EDWARD R. ADAIR

See also NEW BRUNSWICK (English Settlement); ONTARIO (Early Settlement).

UNITED FARM WORKERS OF AMERICA. See MIGRANT LABOR.

UNITED FUNDS. See UNITED WAY OF AMERICA.

UNITED IRISHMEN. See IRELAND (Union with Great Britain).

UNITED JEWISH APPEAL is an organization in the United States that raises funds for Jewish relief agencies. These agencies aid needy Jews in other countries, and help arrange the transportation and settlement of Jewish immigrants to Israel and other nations. The organization also helps communities organize and conduct their local fund-raising campaigns. The United Jewish Appeal was founded in 1939. Its headquarters are at 1290 Avenue of the Americas, New York, N.Y. 10019. Critically reviewed by the UNITED JEWISH APPEAL

UNITED KINGDOM, or officially, UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND, is a union of four countries: England, Scotland, Wales, and Northern Ireland. The term *Great Britain* is commonly used in place of *United Kingdom* and is the title of the WORLD BOOK article on that country.

King James I used the term United Kingdom as early as 1604 to show that the kingdoms of England and Scotland were joined under his rule. But it was not until 1707 that the Act of Union formed the Kingdom of Great Britain. An act of 1800 formed the United Kingdom of Great Britain and Ireland, with a unified parliament. The term *United Kingdom* became inappropriate when the larger part of Ireland won independence in 1921 and became the Irish Free State (now the Republic of Ireland). Six counties in northeastern Ireland remained with Great Britain. They form Northern Ireland.

UNITED MINE WORKERS OF AMERICA

The Royal Titles Act of 1927 dropped the words United Kingdom, but the phrase was used again during World War II. In 1945, Britain signed the United Nations charter as the United Kingdom of Great Britain and Northern Ireland. The full title was confirmed in the proclamation following the Royal Titles Act of 1953. By this act, Queen Elizabeth II became "by the grace of God of the United Kingdom of Great Britain and Northern Ireland Queen, Head of the Commonwealth, Defender of the Faith." JOHN W. WEBB

See also ENGLAND; GREAT BRITAIN; NORTHERN IRELAND; SCOTLAND; WALES.

UNITED METHODIST CHURCH is the largest Methodist denomination in the United States. It was formed in 1968 through a union of the Methodist Church and the Evangelical United Brethren Church. The United Methodist Church has more than 42,000 congregations in the United States. It supports 14 seminaries and over 140 colleges, and has more than 1,500 missionaries in about 50 countries. The church has about 50 bishops supervising administration in the United States.

The United Methodist Church takes active stands on social issues. It opposes the use of alcoholic beverages, favors increased reliance on the United Nations to work for world peace, and urges an end to racial discrimination. For membership, see RELIGION (table: Major Religious Bodies [Methodists]). EARL KENNETH WOOD

See also METHODISTS.

UNITED METHODIST YOUTH FELLOWSHIP is the youth organization of the United Methodist Church. Most United Methodist churches in the United States have at least one youth group. Each group's activities may include study, fellowship groups, choirs, service projects, tours, summer camps, and conferences. The programs are for junior high-school and high-school youth. The fellowship has about 1½ million members in 39,000 churches. The youth fellowships of the Methodist Church and the Evangelical United Brethren Church formed the United Methodist Youth Fellowship when the two churches merged in 1968. The organization's address is Box 871, Nashville, Tenn. 37202.

Critically reviewed by the UNITED METHODIST YOUTH FELLOWSHIP

UNITED MINE WORKERS OF AMERICA (UMW) is an industrial trade union that represents the workers in most of the coal mines and coal-processing industries of the United States. It also has local unions in Canada.

The union was organized in Columbus, Ohio, in 1890. It belonged to the American Federation of Labor until 1936. The UMW helped form the Congress of Industrial Organizations in 1935, but withdrew in 1942. It has remained independent, except for a brief reaffiliation with the AFL in 1947.

The UMW won fame under John Mitchell in the early 1900's. John L. Lewis served as union president from 1919 until his retirement in 1960. Under Lewis, the union experienced its greatest growth and obtained many benefits for its members. The UMW has headquarters at 900 15th Street NW, Washington, D.C. 20005. Critically reviewed by the UNITED MINE WORKERS OF AMERICA

See also LEWIS, JOHN L.; MITCHELL, JOHN; COAL (Unions); LABOR (table: Important U.S. Labor Unions); ROOSEVELT, THEODORE (Friend of Labor); WEST VIRGINIA (Labor Troubles).

WORLD BOOK photo by Dan Budnik

"Let Us Beat Swords into Plowshares" expresses the United Nations goal of world peace. This statue stands on the grounds of UN headquarters in New York City. The UN Secretariat Building rises in the background. The statue, by the Russian sculptor Yevgeny Vuchetich, was a gift of Russia to the UN.

UNITED NATIONS

UNITED NATIONS (UN) is an organization of 141 nations that works for world peace and security and the betterment of mankind. Countries of every part of the world belong to the UN. They range in size from Russia to the Maldives. Each member nation sends representatives to UN headquarters in New York City, where they discuss and try to solve problems.

The United Nations has two main goals: peace and human dignity. If fighting between two or more countries breaks out anywhere, the UN may be asked to try to stop it. After the fighting stops, the UN may help work out ways to keep it from starting again. But the UN tries above all to deal with problems and disputes before they lead to fighting. It seeks the causes of war and tries to find ways to eliminate them.

The United Nations has met with both success and failure in its work. It has been able to keep some disputes from developing into major wars. It has also helped people in many parts of the world gain their freedom and better their way of life. But disagreements among UN members prevent the organization from doing a completely effective job of peacekeeping. Serious financial troubles also weaken the UN.

The United Nations was established on Oct. 24, 1945, shortly after the end of World War II. As the war drew to an end, the nations that opposed Germany, Italy, and Japan decided that such a war must never happen again. Representatives of these nations met in San Francisco in April, 1945, and worked out a plan for an organization to help keep peace in the world. This plan was described in a document called the *Charter of the United Nations*. In June, 1945, 50 nations signed the UN Charter. They were the first UN members. Since then, more than 90 other nations have joined the UN. Many of these countries were still colonies when the UN was founded.

In some ways, the UN resembles the League of Nations, which was organized after World War I (see LEAGUE OF NATIONS). Many of the nations that founded the UN had also founded the League. Like the League, the UN was established to help keep peace between nations. The main organs of the UN are much like those of the League. But the UN differs from the League in

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Lincoln P. Bloomfield, the contributor of this article, is Professor of Political Science at the Massachusetts Institute of Technology and the author of The United Nations and U.S. Foreign Policy *and other books on international affairs. The photographs in the article are used through the courtesy of the United Nations unless otherwise credited.*

Almost Every Nation Belongs to the UN, as this map shows. The emblem on the UN flag, *left,* includes a world map. The olive branches stand for peace.

two main ways. First, all the great military powers except Communist China were UN members from the beginning, and Communist China gained membership in 1971. On the other hand, several powerful countries, including the United States, either did not join the League or withdrew from it. Second, the UN's concern with economic and social problems gives it broader responsibilities than the League had.

The six major organs of the UN carry on the work of the organization. These organs are (1) the General Assembly, (2) the Security Council, (3) the Secretariat, (4) the Economic and Social Council, (5) the International Court of Justice, and (6) the Trusteeship Council. A number of specialized agencies related to the UN deal with such problems as communications, food and agriculture, health, and labor.

United Nations headquarters consists of several buildings in New York City. The buildings stand in a group on a landscaped site bordering the East River. The three main buildings are the General Assembly Building, the Secretariat Building, and the Conference Building. A smaller building next to the Secretariat Building houses the library of the United Nations. Members of the United Nations have donated many furnishings and works of art for the UN buildings. The flags of all the members fly in front of UN headquarters.

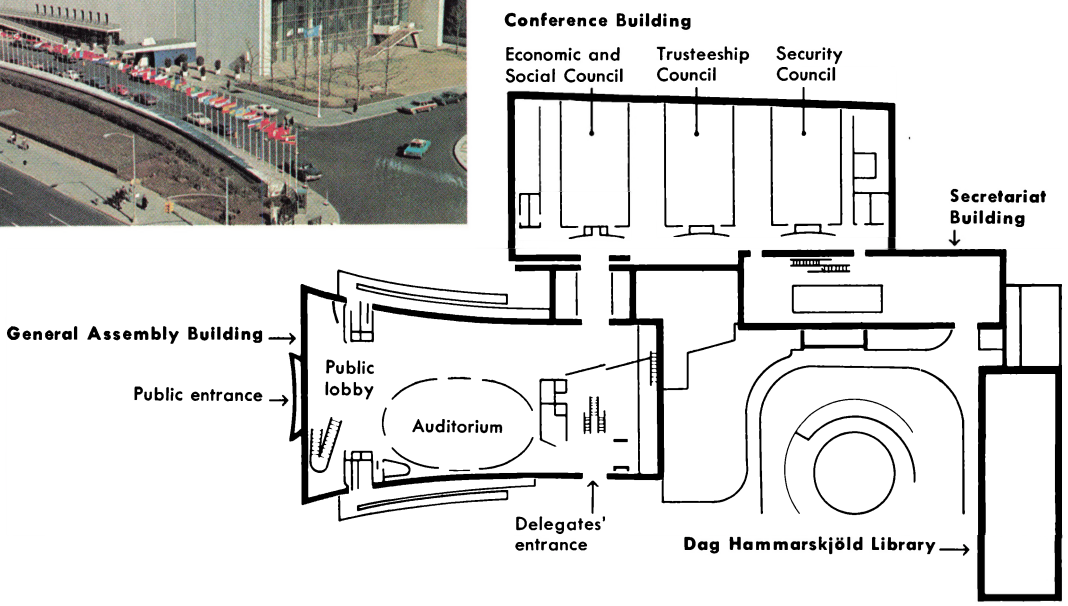
THE 141 MEMBERS OF THE UNITED NATIONS

The charter members of the UN do not have dates after their names. Other nations are listed with their years of admission.

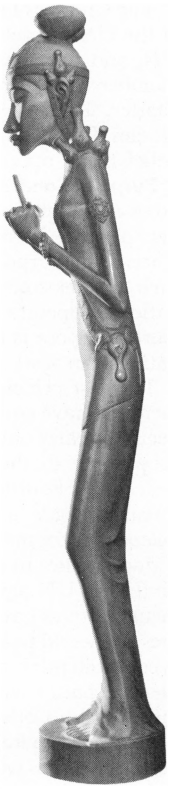
Afghanistan (1946)
Albania (1955)
Algeria (1962)
Argentina
Australia
Austria (1955)
Bahamas (1973)
Bahrain (1971)
Bangladesh (1974)
Barbados (1966)
Belgium
Bhutan (1971)
Bolivia
Botswana (1966)
Brazil
Bulgaria (1955)
Burma (1948)
Burundi (1962)
Byelorussian S.S.R.
Cambodia (1955)
Cameroon (1960)
Canada
Cape Verde Islands (1975)
Central African Republic (1960)
Chad (1960)
Chile
China*
Colombia
Congo (1960)
Costa Rica
Cuba
Cyprus (1960)
Czechoslovakia
Dahomey (1960)
Denmark
Dominican Republic
Ecuador
Egypt
El Salvador
Equatorial Guinea (1968)
Ethiopia
Fiji (1970)
Finland (1955)
France
Gabon (1960)
Gambia (1965)
Germany (East) (1973)
Germany (West) (1973)
Ghana (1957)
Great Britain
Greece
Grenada (1974)
Guatemala
Guinea (1958)
Guinea-Bissau (1974)
Guyana (1966)
Haiti
Honduras
Hungary (1955)
Iceland (1946)
India
Indonesia (1950)
Iran
Iraq
Ireland (1955)
Israel (1949)
Italy (1955)
Ivory Coast (1960)
Jamaica (1962)
Japan (1956)
Jordan (1955)
Kenya (1963)
Kuwait (1963)
Laos (1955)
Lebanon
Lesotho (1966)
Liberia
Libya (1955)
Luxembourg
Malagasy Republic (1960)
Malawi (1964)
Malaysia (1957)
Maldives (1965)
Mali (1960)
Malta (1964)
Mauritania (1961)
Mauritius (1968)
Mexico
Mongolia (1961)
Morocco (1956)
Mozambique (1975)
Nepal (1955)
Netherlands
New Zealand
Nicaragua
Niger (1960)
Nigeria (1960)
Norway
Oman (1971)
Pakistan (1947)
Panama
Paraguay
Peru
Philippines
Poland
Portugal (1955)
Qatar (1971)
Romania (1955)
Russia (U.S.S.R.)
Rwanda (1962)
São Tomé and Príncipe (1975)
Saudi Arabia
Senegal (1960)
Sierra Leone (1961)
Singapore (1965)
Somalia (1960)
South Africa
Spain (1955)
Sri Lanka (1955)
Sudan (1956)
Swaziland (1968)
Sweden (1946)
Syria
Tanzania (1961)
Thailand (1946)
Togo (1960)
Trinidad and Tobago (1962)
Tunisia (1956)
Turkey
Uganda (1962)
Ukrainian S.S.R.
United Arab Emirates (1971)
United States
Upper Volta (1960)
Uruguay
Venezuela
Yemen (Aden) (1967)
Yemen (Sana) (1947)
Yugoslavia
Zaire (1960)
Zambia (1964)

*Nationalist China held a seat in the UN until October, 1971, when the General Assembly voted to expel Nationalist China and admit Communist China.

UN Headquarters Buildings, *above,* are identified in the diagram below. They are the General Assembly, Conference, and Secretariat buildings and the Dag Hammarskjöld Library. Guided tours of the UN start in the General Assembly Building, *left.*

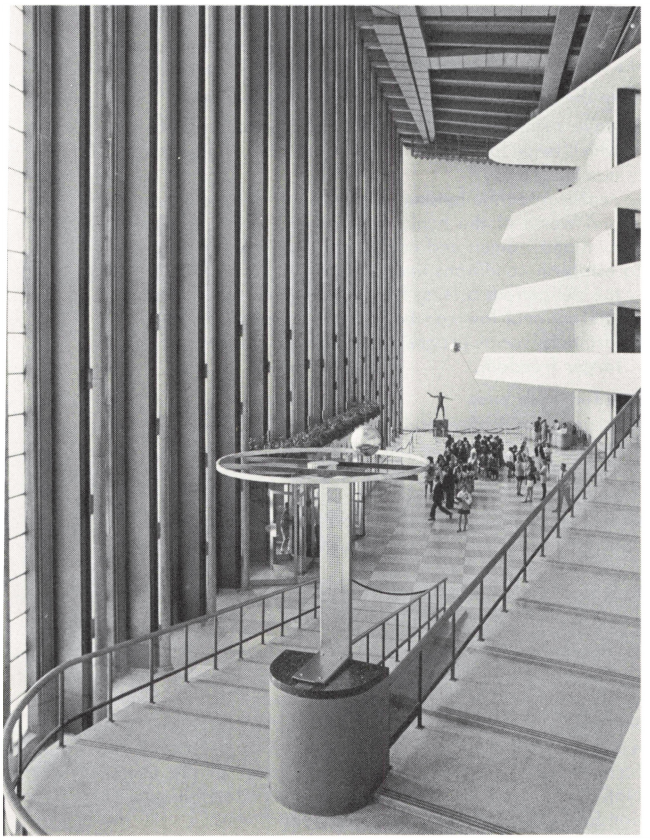


The Delegates' Lounge in the Conference Building is used for informal meetings. The building also has formal meeting rooms for the Economic and Social, Trusteeship, and Security councils.



A Statue Representing Peace stands in a second-floor hall of the General Assembly Building. The wooden statue, carved by an anonymous Balinese sculptor, is a gift to the United Nations from the people of Indonesia.

The Lobby of the General Assembly Building has displays donated by several UN members, including a huge pendulum, *center,* from The Netherlands. The ramp leads to the auditorium.



Visitors to the Secretariat Building view a stained-glass memorial to UN Secretary-General Dag Hammarskjöld and 15 others killed in a plane crash. The French artist Marc Chagall created the memorial, which was paid for by contributions from UN staff members.

The Charter of the United Nations is the constitution of the UN. It includes the plan used for organizing the UN, and the rules by which the UN is governed. UN members agree to carry out the requirements of the charter. The charter has 19 chapters divided into 111 articles that explain the *purposes* (goals), *principles* (basic beliefs), and operating methods of the UN.

Purposes and Principles. The charter lists four purposes and seven principles of the United Nations. The first purpose is to preserve world peace and security. The second purpose is to encourage nations to be just in their actions toward each other. The third is to help nations cooperate in trying to solve their problems. The fourth purpose is to serve as an agency through which nations can work toward these goals.

The first principle of the United Nations is that all members have equal rights. Second, all members are expected to carry out their duties under the charter. Third, they agree to the principle of settling their disputes peacefully. Fourth, they agree not to use force or the threat of force against other nations, except in self-defense. Fifth, members agree to help the UN in every action it takes to carry out the purposes of the charter. Sixth, the UN agrees to act on the principle that non-member states have the same duties as member states to preserve world peace and security. And seventh, the UN accepts the principle of not interfering in the actions of a member nation within its own borders. But these actions must not hurt other nations.

Membership Requirements. The first members of the United Nations were the nations that signed the charter in 1945. Since then, many other nations have requested to join the organization. The charter states that membership in the UN is open to all "peace-loving states" that are "able and willing" to carry out the duties required by the charter. Both the Security Council and the General Assembly must approve applications for membership. A member nation that violates the charter may be suspended or even expelled from the United Nations.

The Six Major UN Organs. The charter sets up the six main organs of the UN and explains the duties, powers, and operating methods of each. The *General Assembly* is the only major organ in which all UN members are represented. The charter permits the Assembly to discuss any question of importance to the UN and to recommend action to be taken by the members or by other UN organs. The *Security Council* has the major responsibility in the UN for keeping the peace. The charter gives the Council special powers to carry out this responsibility. The *Secretariat* has the job of helping all the other organs do their work as efficiently as possible. The charter gives the *Economic and Social Council* several duties, such as advancing human rights and helping people to better their way of life. The *International Court of Justice* handles international legal disputes. The charter established the *Trusteeship Council* to watch over a number of territories that were not self-governing at the time the UN was founded.

The United Nations has established many other agencies, committees, and commissions since the charter was written. But the six main organs are the only UN bodies that operate under rules included in the charter.

Amending the Charter. The UN Charter sets forth the rules for changing the charter. Amendments may be proposed in either of two ways. The General Assembly may propose an amendment if two-thirds of all its members agree to do so. Or two-thirds of the General Assembly members and any nine members of the Security Council may call a *General Conference* to discuss making changes in the charter. As in the General Assembly, a two-thirds vote of a General Conference is required to propose an amendment. A proposed amendment does not go into effect until it has been approved by two-thirds of all UN members, including the five permanent members of the Security Council. In 1965, the charter was amended to increase the size of the Security Council from 11 to 15 members. The amendment was proposed without calling a General Conference.

The charter called for the 10th yearly session of the General Assembly to make plans for a General Conference if one had not already taken place. In 1955, the Assembly took up the question and appointed a planning committee. The committee has met from time to time and has reported to the General Assembly. But the Assembly has taken no further action.

THE PREAMBLE TO THE UNITED NATIONS CHARTER

A preamble of about 200 words precedes the chapters of the charter and expresses the guiding spirit of the organization. Jan Christiaan Smuts of South Africa is credited with drafting the preamble (see SMUTS, JAN C.). The complete preamble states:

"We the peoples of the United Nations determined

to save succeeding generations from the scourge of war, which twice in our lifetime has brought untold sorrow to mankind, and

to reaffirm faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights of men and women and of nations large and small, and

to establish conditions under which justice and respect for the obligations arising from treaties and other sources of international law can be maintained, and

to promote social progress and better standards of life in larger freedom,

and for these ends

to practice tolerance and live together in peace with one another as good neighbors, and

to unite our strength to maintain international peace and security, and

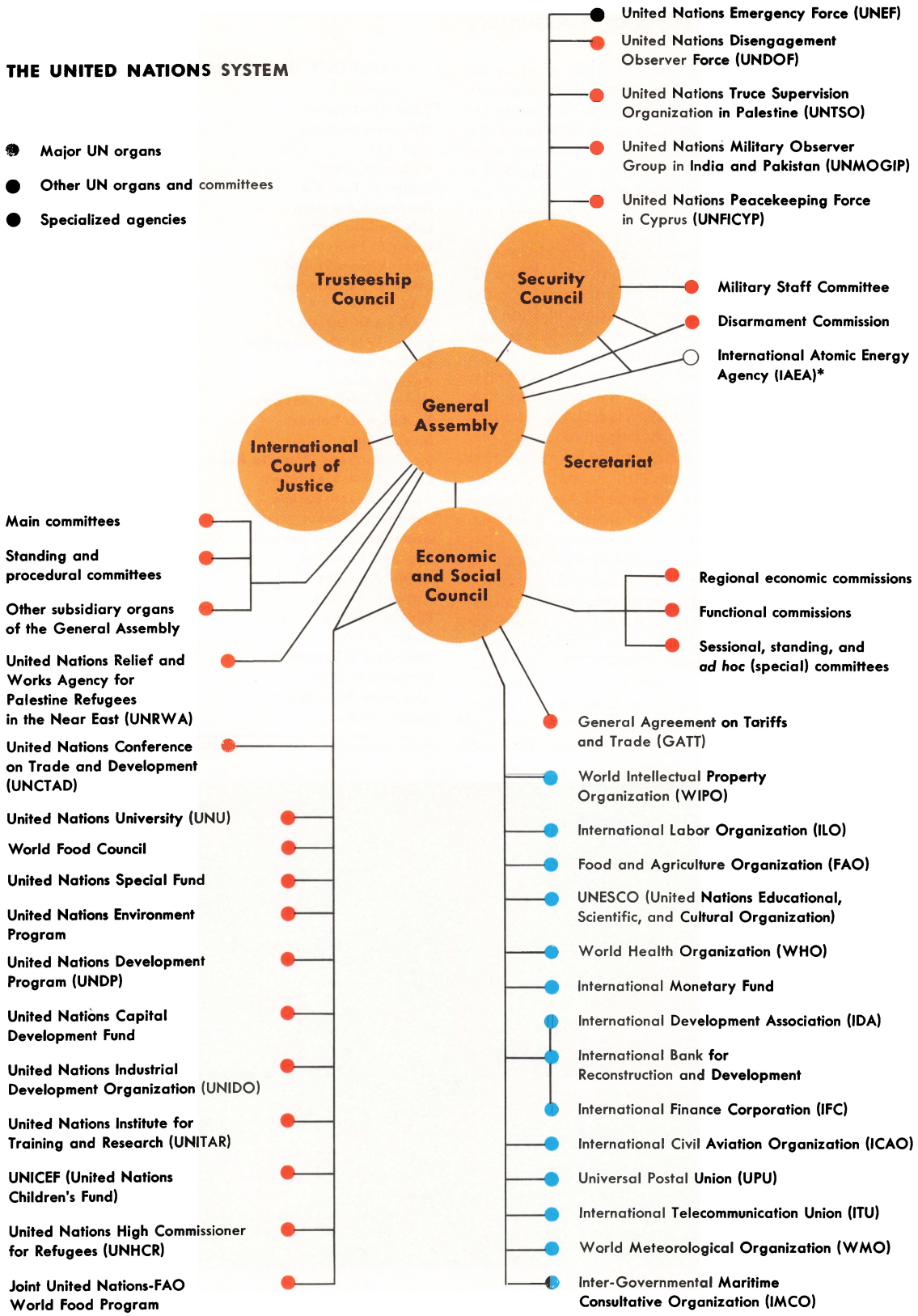
to ensure, by the acceptance of principles and the institution of methods, that armed force shall not be used, save in the common interest, and

to employ international machinery for the promotion of the economic and social advancement of all peoples,

have resolved to combine our efforts to accomplish these aims.

Accordingly, our respective Governments, through representatives assembled in the city of San Francisco, who have exhibited their full powers found to be in good and due form, have agreed to the present Charter of the United Nations and do hereby establish an international organization to be known as the United Nations."

THE UNITED NATIONS SYSTEM



*An independent intergovernmental organization sponsored by the UN.

WORLD BOOK chart

The General Assembly is the only major organ of the United Nations in which all members are represented. Each member may send five delegates, five alternate delegates, and as many advisers as it wishes to the General Assembly. But each nation has only one vote.

The General Assembly elects a new president and a number of vice-presidents at the beginning of each annual session. The president's main duty is to lead the Assembly's discussions and direct its work.

Powers. The General Assembly is responsible in some way for every other organ of the United Nations. It elects or takes part in electing the members of the other major organs, and it directs the operations of some UN bodies. It also controls the UN's budget. It decides how much money each member should contribute and how much of the UN's funds each UN body should receive.

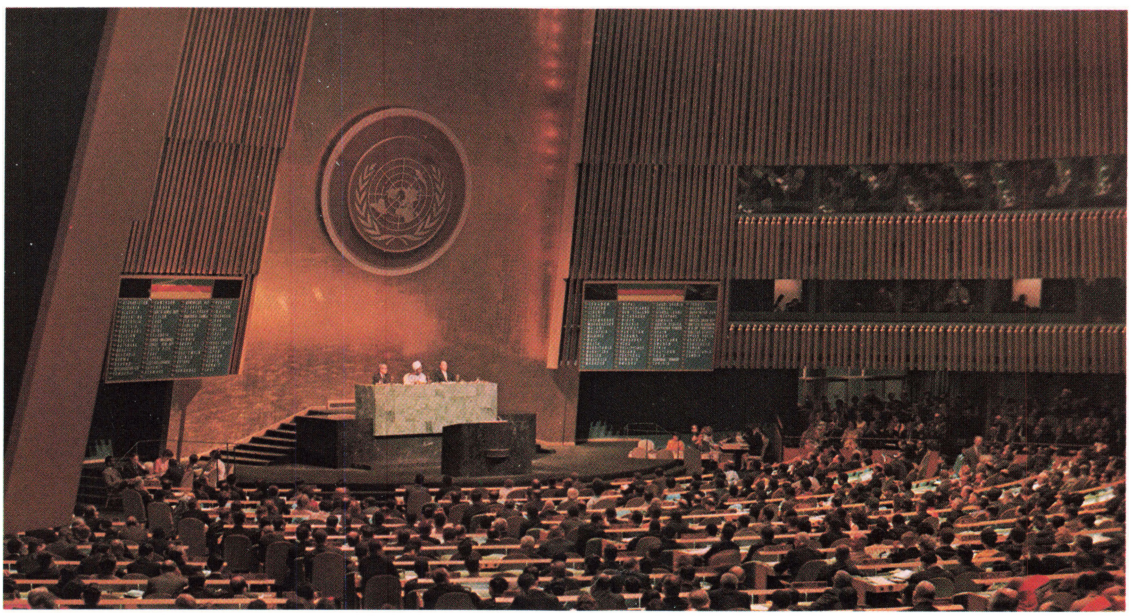
The General Assembly may discuss any question that concerns the work of the UN. It reaches decisions through a vote of its members. As a result of such a vote, the Assembly may suggest actions to be taken by other UN bodies or by member nations. According to the charter, the only decisions of the General Assembly that UN members must obey are votes on the UN budget. All other decisions are simply recommendations.

The General Assembly's responsibility for keeping the peace is second only to the similar responsibility of the Security Council. The kind of peacekeeping action that the Assembly can take has been strengthened since the charter was written. In the early years of the UN, sharp disagreements in the Security Council prevented the Council from acting in many cases. In 1950, the General Assembly approved a *resolution* (formal statement) called "Uniting for Peace." This resolution gave the Assembly the power to step in whenever peace is threatened and

PRESIDENTS OF THE UN GENERAL ASSEMBLY

Name	Country	Dates
*Paul-Henri Spaak	Belgium	1946
Oswaldo Aranha	Brazil	1947
José Arce	Argentina	1948
Herbert V. Evatt	Australia	1948-49
*Carlos P. Romulo	Philippines	1949
Nasrollah Entezam	Iran	1950-51
Luis Padilla Nervo	Mexico	1951-52
*Lester B. Pearson	Canada	1952-53
*Mme. Vijaya Pandit	India	1953-54
Eelco N. van Kleffens	Netherlands	1954
José Maza	Chile	1955
Rudecindo Ortega	Chile	1956
Prince Wan Waithayakon	Thailand	1956-57
Sir Leslie Munro	New Zealand	1957-58
Charles Malik	Lebanon	1958-59
Victor Andrés Belaúnde	Peru	1959-60
Frederick H. Boland	Ireland	1960-61
Mongi Slim	Tunisia	1961-62
Sir Muhammad Zafrulla Khan	Pakistan	1962-63
Carlos Sosa Rodríguez	Venezuela	1963
Alex Quaison-Sackey	Ghana	1964-65
*Amintore Fanfani	Italy	1965
Abdul Rahman Pazhwak	Afghanistan	1966-67
Corneliu Manescu	Romania	1967-68
Emilio Arenales	Guatemala	1968
Angie E. Brooks	Liberia	1969
Edvard Hambro	Norway	1970-71
Adam Malik	Indonesia	1971-72
Stanisław Trepczyński	Poland	1972-73
Leopoldo Benites	Ecuador	1973-74
Abdelaziz Bouteflika	Algeria	1974-75
Gaston Thorn	Luxembourg	1975-

*Has a separate biography in WORLD BOOK.



A General Assembly Session. The secretary-general, the Assembly president, and an under-secretary sit on the stage. Interpreters, reporters, and cameramen work in booths along the wall.

the Security Council has failed to act. In such an emergency, the Assembly can recommend actions for the UN, including the use of armed force if necessary.

Meetings and Voting. The General Assembly holds one *regular session* each year, beginning on the third Tuesday in September and lasting about three months. A *special session* may be called if either the Security Council or a majority of member states requests it. Several special sessions have been called to discuss such matters as peacekeeping and finances. The "Uniting for Peace" resolution in 1950 set up a system for calling an *emergency special session* of the Assembly. Such a meeting can be called on 24 hours' notice if peace is threatened and the Security Council has not acted. Any nine members of the Security Council or a majority of UN members may call an emergency special session. Such sessions have been held to deal with serious situations in the Middle East, Hungary, and other parts of the world.

Most questions that are voted on in the General Assembly are decided by a simple majority vote. Some subjects that the charter calls "important questions" need a two-thirds majority vote. These topics include peace and security and the election of new UN members. A simple majority vote of the Assembly may also make any other question an "important" one.

Committees. The UN Charter permits the General Assembly to create as many committees as it needs to help carry on its work. The Assembly has set up seven main committees—the First, Second, Third, Fourth, Fifth, and Sixth committees, and the Special Political Committee. Every member of the General Assembly—thus, every UN member—may have a representative on all these committees.

The First Committee discusses political and security questions and arms control. The Special Political Committee helps the First Committee with its tremendous volume of work. The Second Committee deals with economic and financial questions, the Third with social and cultural matters, and the Fourth with problems of countries that are not self-governing. The Fifth Committee handles administrative and budget matters, and the Sixth handles questions of law. Each committee studies the problems that have been assigned to it and then makes its recommendations to the General Assembly.

The Assembly has also set up other committees. They help organize and conduct each Assembly session, advise the Second and Fifth committees on financial and budget matters, or deal with problems involving nuclear energy, colonialism, and peacekeeping.

UNITED NATIONS/*The Security Council*

The UN Charter makes the Security Council responsible for keeping the peace. The Council has 15 members, of which 5 are permanent. The permanent members are France, Great Britain, Communist China, Russia, and the United States. The other 10 members are elected to two-year terms by the General Assembly. Each of the 15 members has one delegate on the Council.

Powers. The Security Council has the power to decide what action the UN should take to settle international disputes. The charter states that the Council's decisions are made in the name of all UN members, who must accept them and carry them out. The Council encourages the peaceful settlement of disputes by calling on the opposing sides to work out a solution. Or the Council may ask the two or more sides to accept a settlement worked out by other nations, individuals, or groups.

The Council itself may investigate a dispute and suggest ways of settling it. For example, the Council may call on UN members to stop trading with a country that is endangering peace and security. It may also ask the members to cut off communications with such a state, or to end contacts with its government. If such actions are not effective, the Security Council may ask UN members to furnish military forces to settle the dispute. The *Working for Peace* section of this article describes some of the actions taken by the Security Council. The final section discusses the UN's peacekeeping difficulties.

The Security Council also has several other important powers. It must approve all applications for membership in the UN. It selects a candidate for secretary-general. And it can recommend plans for arms control.

Meetings and Committees. The Security Council must be able to meet at any time. Meetings may be called to consider any situation serious enough to lead to war. Such a situation can be brought to the attention of the Security Council by any UN member—and in certain cases by nonmembers—by the secretary-general or by any major UN organ. The delegates must be able to attend a meeting as soon as it is called.

The Council makes its own rules for conducting its meetings. In the early years of the UN, it became a custom for the representative of a different nation to serve as president each month. The representatives take turns, in the order that their country's name appears in the English alphabet. UN members that are not members of the Council—and even nations that are not UN members—may be invited to take part in debates that affect them. But these nations have no vote.

The Council may set up as many committees as it needs. The charter calls only for a Military Staff Committee, made up of military representatives of the five permanent members. Other committees have been appointed from time to time, especially to help the Council organize its work and to consider applications for UN membership.

Voting in the Security Council differs from that in any other UN organ. The Council can take action on some questions if any nine members vote in favor of the action. But on many other questions, the Council can act only if nine members—including all five permanent members—agree to do so. A "no" vote by any perma-

Meetings of the Security Council are held in the Council chamber. Delegates and their assistants sit at the semicircular table. Interpreters and other UN employees are in the center.

nent member defeats such a question, no matter how many other members vote in favor of it. This special voting right of the permanent members is called a *veto*.

Almost any decision of the Council can be vetoed, but the Council has never established what kinds of decisions cannot be vetoed. Through the years, a few customs concerning the veto have developed. For example, a permanent member usually does not veto a decision about what subjects the Council should discuss, or about when the Council should adjourn. But a permanent member sometimes vetoes a decision about the order in which subjects are to be discussed. If a permanent member decides not to vote, or is absent at the time of voting, its action is not considered a veto.

The use of the veto in the Security Council has prevented the United Nations from dealing with a number of major problems. Russia has used the veto over 100 times, much more than the other four permanent members together. The United States used the veto for the first time in March, 1970. It vetoed a Security Council resolution requiring UN members to cut off communications with Rhodesia.

MEMBERS OF THE UN SECURITY COUNCIL

China, France, Great Britain, Russia, and the United States are permanent members. Other members, with two-year terms, are listed below. Their number was increased to 10 in 1966.

1946 Australia, Brazil, Egypt (1-year term), Mexico (1-year term), Netherlands (1-year term), Poland
1947 Australia, Belgium, Brazil, Colombia, Poland, Syria
1948 Argentina, Belgium, Canada, Colombia, Syria, Ukrainian S.S.R.
1949 Argentina, Canada, Cuba, Egypt, Norway, Ukrainian S.S.R.
1950 Cuba, Ecuador, Egypt, India, Norway, Yugoslavia
1951 Brazil, Ecuador, India, Netherlands, Turkey, Yugoslavia
1952 Brazil, Chile, Greece, Netherlands, Pakistan, Turkey
1953 Chile, Colombia, Denmark, Greece, Lebanon, Pakistan
1954 Brazil, Colombia, Denmark, Lebanon, New Zealand, Turkey
1955 Belgium, Brazil, Iran, New Zealand, Peru, Turkey
1956 Australia, Belgium, Cuba, Iran, Peru, Yugoslavia
1957 Australia, Colombia, Cuba, Iraq, Philippines (replacing Yugoslavia), Sweden
1958 Canada, Colombia, Iraq, Japan, Panama, Sweden
1959 Argentina, Canada, Italy, Japan, Panama, Tunisia
1960 Argentina, Ceylon, Ecuador, Italy, Poland, Tunisia
1961 Ceylon, Chile, Ecuador, Liberia, Turkey (replacing Poland), United Arab Republic
1962 Chile, Egypt, Ghana, Ireland, Romania, Venezuela
1963 Brazil, Ghana, Morocco, Norway, Philippines (replacing Romania), Venezuela
1964 Bolivia, Brazil, Czechoslovakia, Ivory Coast, Morocco, Norway
1965 Bolivia, Ivory Coast, Jordan, Malaysia (replacing Czechoslovakia), Netherlands, Uruguay
1966 Argentina, Bulgaria, Japan, Jordan, Mali, Netherlands, New Zealand, Nigeria, Uganda, Uruguay
1967 Argentina, Brazil, Bulgaria, Canada, Denmark, Ethiopia, India, Japan, Mali, Nigeria
1968 Algeria, Brazil, Canada, Denmark, Ethiopia, Hungary, India, Pakistan, Paraguay, Senegal
1969 Algeria, Colombia, Finland, Hungary, Nepal, Pakistan, Paraguay, Senegal, Spain, Zambia
1970 Burundi, Colombia, Finland, Nepal, Nicaragua, Poland, Sierra Leone, Spain, Syria, Zambia
1971 Argentina, Belgium, Burundi, Italy, Japan, Nicaragua, Poland, Sierra Leone, Somalia, Syria
1972 Argentina, Belgium, Guinea, India, Italy, Japan, Panama, Somalia, Sudan, Yugoslavia
1973 Australia, Austria, Guinea, India, Indonesia, Kenya, Panama, Peru, Sudan, Yugoslavia
1974 Australia, Austria, Byelorussian S.S.R., Cameroon, Costa Rica, Indonesia, Iraq, Kenya, Mauritania, Peru
1975 Byelorussian S.S.R., Cameroon, Costa Rica, Guyana, Iraq, Italy, Japan, Mauritania, Sweden, and Tanzania

The Secretariat manages the day-to-day business of the United Nations. Its main job is to provide services for all the other UN organs. The Secretariat is made up of the secretary-general and other administrators assisted by clerks, secretaries, and specialists.

The Secretary-General has broader powers than any other United Nations official. He is the chief administrator of the UN and reports to the General Assembly each year on the organization's problems and accomplishments. UN organs often give him special assignments. Governments ask his advice, and he uses his influence to help solve many problems. Most important of all, the charter gives the secretary-general the power to advise the Security Council of any situation he thinks threatens world peace.

The secretary-general is nominated by the Security Council and appointed by the General Assembly. All five permanent members of the Security Council must agree on a candidate before he can be nominated. After the Council selects a candidate, it recommends him to the General Assembly. A simple majority vote of the Assembly appoints a secretary-general. The Assembly also decides the length of his term.

Trygve Lie of Norway, the first secretary-general, served from 1946 to 1953. He was elected to a five-year term and was re-elected for another three years. Lie resigned late in 1952 and left office in 1953. Lie spoke out on important questions and criticized the policies of some UN members.

Dag Hammarskjöld of Sweden followed Lie as secretary-general. Hammarskjöld advanced the right of the secretary-general to act on his own judgment for the UN in a situation threatening peace. Hammarskjöld was elected to a second five-year term in 1958 but was killed in an airplane crash in 1961.

U Thant of Burma was elected to serve the rest of Hammarskjöld's term. In 1962, he was appointed to a full five-year term dating from 1961. He was re-elected to another five-year term in 1966. In 1972, Thant was succeeded by Kurt Waldheim of Austria, who was elected to a full five-year term.

In 1960, the Russians demanded that the UN appoint three persons to serve together as secretary-general. They wanted one representative for the Communist members, another for the Western nations, and a third for the uncommitted nations that supported neither side. The Russians called their proposed three-man leadership a *troika* (see TROIKA). Their effort failed, but after U Thant took office, he appointed a number of undersecretaries. Communist, Western, and uncommitted nations were all represented.

Kurt Waldheim of Austria became secretary-general in January, 1972. He succeeded U Thant of Burma.

Other Employees. The Secretariat has about 9,000 employees, of whom about half work at UN headquarters. The rest work at the UN's European headquarters in Geneva, Switzerland, or in special UN missions and agencies throughout the world.

The secretary-general is responsible for appointing and organizing the staff of the Secretariat. The charter instructs him to choose staff members from as many different member nations as possible. The Secretariat's employees include accountants, economists, lawyers, mathematicians, translators, typists, and writers. Every UN member country may fill at least six Secretariat jobs if it can provide qualified individuals. A UN employee works for the secretary-general and is not allowed to take orders from any member nation.

Trygve Lie of Norway, the first secretary-general, served from 1946 to 1953.

Dag Hammarskjöld of Sweden, who replaced Lie, died in a 1961 plane crash.

U Thant of Burma took over as secretary-general following Hammarskjöld's death.

The Economic and Social Council. The United Nations is the first international organization with a major organ devoted to improving the way people live. The Economic and Social Council works to encourage higher standards of living, better health, cultural and educational cooperation among nations, and observance of human rights. It makes recommendations in these areas to the General Assembly, individual nations, and the UN's specialized agencies. For example, the Council recommends to the General Assembly the economic and social projects it considers worthy of UN support. The Assembly then may grant funds for these projects.

The Economic and Social Council is responsible for working with the specialized agencies. In addition to making recommendations to them, the Council communicates recommendations from the agencies to the General Assembly. The Council also cooperates with more than 100 other organizations throughout the world, including the Red Cross and labor unions.

The Council has 27 member nations. Each year, the General Assembly elects nine members to serve for three years. The Council meets twice a year, but it may also hold special sessions. Each member has one vote, and decisions are made by a simple majority. The Council may allow any UN member or specialized agency to take part in discussions of concern to them. But only Council members may vote.

The Council has a number of commissions that assist in its work. Four commissions deal with the economic problems of certain regions—Africa, Asia and the Far East, Europe, and Latin America. Six others deal with questions of human rights, narcotics, population, social development, statistics, and women's rights. A number of other bodies also assist the Council. They include the governing boards of the United Nations Children's Fund (UNICEF) and the United Nations Development Program.

The International Court of Justice deals with the legal problems of the United Nations. The court has 15 judges, each appointed to a nine-year term. The Security Council and the General Assembly, voting independently, select the judges. No two judges may come from the same country, and the world's major civilizations and legal traditions must be represented. The court traditionally includes one judge from each of the permanent members of the Security Council. It elects a president and vice-president to three-year terms. Headquarters are at The Hague in The Netherlands.

Any UN member may bring a case before the court. The court has helped settle disputes between various countries, including Great Britain and Norway, Belgium and The Netherlands, and Honduras and Nicaragua. These disputes have concerned such matters as fishing rights and the ownership of border territory. The General Assembly and the Security Council have also permitted some nonmember states, such as Switzerland and Liechtenstein, to have cases heard by the court. An individual cannot bring a case to the court unless his government sponsors it.

No nation can be forced to bring its disputes before the International Court of Justice. Many governments have declared that they will seek court rulings in certain types of disputes. Some nations, including the United States, have said that they will decide for themselves what cases to bring before the court. Any nation that seeks a ruling from the court must agree to accept its decision. The court makes its decisions by majority vote.

The International Court gives advisory opinions to the General Assembly upon request. The Assembly also has permitted the Security Council, the Economic and Social Council, the Trusteeship Council, and the specialized agencies to request such opinions.

The Trusteeship Council was designed to help a number of territories that were not self-governing at the end of World War II. Some of these territories were colonies of Italy and Japan. Others were German colonies that had become *mandates* of the League of Nations after World War I (see MANDATED TERRITORY). The UN Charter made the Trusteeship Council responsible for all these territories and for any others that nations might choose to entrust to it. Such areas are called *trust territories*. The Council works to help the trust territories become self-governing or independent.

There were originally 11 trust territories. The UN accepted one or more member nations as *trustees* for each territory. The trustee countries govern the trust territories under the direction of the UN. The Trusteeship Council is made up of representatives of the trustee nations and of all permanent members of the Security Council that do not govern trust territories. The Trusteeship Council meets at least once every year.

Ten trust territories have either become independent or have voted to become a part of other nations. Only one has not decided its own political future—the Trust Territory of the Pacific Islands, governed by the United States.

— PRESENT AND FORMER UN TRUST TERRITORIES —

This table lists the 11 original trust areas, their trustees, and the dates that some have achieved independence.

Name	Trustee	Status
Cameroons	Great Britain	Independent as parts of Cameroon and Nigeria, 1961
Cameroons	France	Independent as Cameroon, 1960
Nauru	Australia	Independent, 1968
New Guinea	Australia	Independent as part of Papua New Guinea, 1975
Pacific Islands (Carolines, Marianas except Guam, Marshalls)	United States	Strategic Area Trusteeship (under the Security Council)
Ruanda-Urundi	Belgium	Independent as Rwanda and Burundi, 1962
Somaliland	Italy	Independent as Somalia, 1960
Tanganyika	Great Britain	Independent, 1961
Togoland	France	Independent as Togo, 1960
Togoland	Great Britain	Independent as part of Ghana, 1957
Western Samoa	New Zealand	Independent, 1962

UNITED NATIONS / *Specialized Agencies*

The specialized agencies are self-governing international organizations related to the United Nations. They deal with such worldwide problems as agriculture, communications, living and working conditions, and health. Some of the agencies are older than the UN itself. Each agency has its own organization, membership, and rules, and each has signed an agreement with the UN. The agency agrees to consider recommendations made by the UN and to report back on steps it takes to carry them out. The Economic and Social Council has the responsibility of helping the UN and the specialized agencies work together effectively.

Each specialized agency was set up to deal with a problem involving the cooperation of many nations. Some of the agencies were established to deal with problems of transportation or communication between countries. Other agencies were set up to help countries that had suffered greatly as a result of war or that had recently become independent. These agencies may provide loans, educational assistance, or other types of aid.

World Book has a separate article on each specialized agency of the UN. See the separate article for detailed information about a particular agency.

A Farming Expert of the Food and Agriculture Organization of the United Nations (FAO) teaches two African students how to operate a tractor. Various specialized agencies assist the UN in many countries.

Specialized Agencies of the United Nations

Food and Agriculture Organization of the United Nations (FAO)
Helps nations improve the production of farms, forests, and fishing waters.

Inter-Governmental Maritime Consultative Organization (IMCO)
Encourages cooperation in international shipping practices and regulations.

International Civil Aviation Organization (ICAO)
Works for greater safety in air service and for standard international flying regulations.

International Development Association (IDA)
Works with the World Bank. It lends money on easier terms than does the World Bank or the International Finance Corporation.

International Finance Corporation (IFC)
Works with the World Bank. It encourages smaller, private developments. The World Bank mostly lends money for large governmental projects.

International Labor Organization (ILO)
Helps improve working and living conditions throughout the world.

International Monetary Fund (IMF)
Helps adjust differences between the money systems used by various countries, making it easier for nations to trade with one another.

International Telecommunication Union (ITU)
Helps nations cooperate to solve problems dealing with radio, telephone, telegraph, and satellite communications.

UNESCO (United Nations Educational, Scientific, and Cultural Organization)
Encourages educational, scientific, and cultural progress to increase understanding among nations.

Universal Postal Union (UPU)
Works for international cooperation in the delivery of mail. See POSTAL UNION, UNIVERSAL.

World Bank
Officially called the International Bank for Reconstruction and Development (IBRD). It lends money to help countries with such projects as dams, irrigation works, power plants, and railroads.

World Health Organization (WHO)
The world's principal agency for dealing with health problems.

World Intellectual Property Organization (WIPO)
Works for international cooperation to protect artistic and literary works, inventions, and trademarks against copying.

World Meteorological Organization (WMO)
Encourages nations to cooperate in weather forecasting.

Scientific Conferences, such as this meeting of atomic scientists at UN headquarters, help keep UN members well informed.

Delegations. Each nation has its own rules for appointing delegates to the United Nations. In the United States, the President nominates the delegates. His choices are subject to approval by the Senate. In Canada, the prime minister and his Cabinet choose the delegates. The delegation of every country has a *head delegate* who is his nation's official representative at the UN.

Most UN members keep a permanent *mission* of one or more representatives at UN headquarters. They have found that a permanent mission is helpful for taking part in long-term projects and for keeping up with current developments.

Breaking the Language Barrier. Dozens of languages are spoken by United Nations delegates. But when conducting official business, the UN uses only five languages—Chinese, English, French, Russian, and Spanish. A delegate may address the General Assembly in any language if he provides a translation into one of the official languages. Skilled interpreters instantly translate his words into each of the other official languages. The delegates wear earphones to listen to the translation they choose.

Groups with Common Interests. As UN membership has grown, most nations with similar interests have banded together. The African nations have their own group, as do the Arab countries and the Asian lands. The Latin-American nations, except for Cuba, form a group, and the Communist nations, including Cuba, make up another. All these groups meet regularly for various reasons—for example, to decide on a plan of action or to agree on candidates in a UN election. Canada and the other members of the Commonwealth of Nations meet together regularly for discussion but seldom vote as a group. A few nations, including Israel, South Africa, the United States, and Yugoslavia, do not meet or vote regularly with any group.

Publications and Information Services. The UN provides information about its work to member nations and to the public. Each major organ of the UN, as well as many UN agencies, issues documents that give a complete account of its work. The main purpose of these documents is to give UN members information that will help them carry out their duties. The UN also issues many publications of interest to the public. The *UN Monthly Chronicle*, for example, prints news of work done by the UN during each month. Booklets and pamphlets deal with such subjects as statistics, human rights, or economic development. Many UN publications are issued in several or all of the five official languages of the organization.

The UN has an Office of Public Information, which is part of the Secretariat. One of its responsibilities is to direct UN information offices in about 50 cities throughout the world. Each office provides information about the UN to people in nearby regions.

HEADS OF UNITED STATES AND CANADIAN DELEGATIONS TO THE UN

Heads of United States Delegations

Name	Served
Warren R. Austin	1947-1953
Henry Cabot Lodge	1953-1960
James J. Wadsworth*	1960-1961
Adlai E. Stevenson	1961-1965
Arthur J. Goldberg	1965-1968
George Ball**	1968
James R. Wiggins	1968-1969
Charles W. Yost	1969-1971
George H. W. Bush	1971-1973
John A. Scali	1973-1975
Daniel Patrick Moynihan	1975-

*Acting head.
**Resigned the day after his nomination was confirmed by the Senate.

Heads of Canadian Delegations

Name	Served
Andrew G. L. McNaughton	1948-1950
R. G. Riddell	1950-1951
E. Herbert Norman*	1951
D. M. Johnson	1951-1955
R. A. Mackay	1955-1958
C. S. A. Ritchie	1958-1962
Paul Tremblay	1962-1966
George Ignatieff	1966-1968
Yvon Beaulne	1969-1972
Saul Rae	1972-

*Served as acting head from March to September. Not considered an official head of delegation by the UN.

An increasingly important goal of the United Nations is to help make the world a better, safer place in which to live. One way the UN works toward this goal is by providing various types of aid for countries and different groups of people. The UN also works for progress in many other fields, including human rights, peaceful uses of nuclear energy, and pollution control.

Economic and Technical Aid consists of grants, loans, training programs, and other means of helping nations develop their resources, production, and trade. After World War II, the International Bank and the International Monetary Fund gave financial assistance to war-torn countries. But the amount of aid they could give was small compared with the amount needed. Most western European countries depended on the United States to help them recover from the war.

As more and more poor countries joined the UN, the organization began to help them. The resources of these countries are either undeveloped or have been developing slowly. Many such nations have become independent since World War II.

The UN dedicated the period from 1961 through 1970 as the first United Nations Development Decade. The UN's goal during this period was to help the developing countries increase their national income by 5 per cent each year. The developed nations were asked to donate 1 per cent of their yearly national income to the program.

The first Development Decade did not meet all its goals, but some progress was made. The International Bank increased the number and size of its loans for the construction of roads, factories, and similar projects. In 1964, the UN held a Conference on Trade and Development (UNCTAD). The main aim of this conference was to encourage international trade, especially between the rich, developed countries and the poor, developing ones. The conference set up a Trade and Development Board, and itself became a permanent organ of the General Assembly. UNCTAD decides on courses of UN action concerning trade and development. The Trade and Development Board carries out UNCTAD's decisions. It meets at least twice a year to consider such matters as improving international shipping or helping the developing countries find markets for their products.

In 1965, the UN combined its technical aid programs to form the United Nations Development Program (UNDP). The UNDP helps nations make studies of their unused natural resources so they can find ways to use them. For example, it suggests ways for nations to make their farms, mines, and water resources more productive. The program also helps people learn the skills needed to develop their country's resources. The UN has helped about half a million men and women learn to manage, as well as work in, industries that will benefit their countries. In 1966, the General Assembly set

Arab Refugees are one of the many groups of people in various parts of the world that receive UN aid. UN agencies also provide loans and other types of aid for underdeveloped countries.

up the United Nations Industrial Development Organization (UNIDO) to encourage industrialization in developing countries.

The UN's second Development Decade extends from 1971 through 1980. During this period, the UN planned to increase its efforts to expand international trade and to provide economic and technical assistance. It is also trying to help the developing countries regulate the growth of their populations.

Aid to Refugees. The United Nations aids refugees by protecting their legal rights, providing them with food and shelter, and finding them new homes. The UN has declared that the legal rights of refugees include the right to a job, to an education, and to freedom of religion. During World War II, 44 governments cooperated in setting up the United Nations Relief and Rehabilitation Administration (UNRRA) to conduct war relief. After the United Nations was created, UNRRA was replaced by the International Refugee Organization (IRO), a specialized agency. By 1951, the worst of the war-caused problems were over and the IRO was discontinued.

Small Private Industries in developing countries, such as this textile company in the Philippines, receive financial assistance from UN agencies. The UN also aids large government projects.

In 1951, the General Assembly set up the Office of the United Nations High Commissioner for Refugees. This agency has assisted refugees from many countries. The main duty of the High Commissioner is to protect the rights of refugees in foreign countries. The Office of the High Commissioner has a small fund raised by voluntary contributions. But in general, it must work through governments and private agencies.

The UN has a special agency to assist Arab refugees in Palestine—the United Nations Relief and Works Agency for Palestine Refugees in the Middle East (UNRWA). The General Assembly set up the agency to help Arabs made homeless by the 1948 war between Israel and the Arab states. There have been continual wars in this region, and more than a million Arabs have become refugees. But UNRWA cannot find homes for these refugees so long as Israel and the Arab states continue to fight each other. The most it can do is try to provide them with food, shelter, medical care, and other services. UNRWA's funds are limited, and in the late 1960's it was able to spend only about $40 a year for each refugee.

Aid to Children. The General Assembly created the United Nations Children's Fund (UNICEF) in 1946. UNICEF'S job was to provide food, clothing, and medical supplies for child victims of World War II. The emergency caused by the war ended by the early 1950's, but UNICEF had become so popular that the General Assembly made it a permanent organization in 1953. Today, UNICEF provides aid for child development and care, job training, and family planning.

UNICEF's funds come from voluntary contributions. About three-fourths of its funds are donated by governments, and the rest is raised privately. The United States Committee for UNICEF raises several million dollars yearly from Halloween trick-or-treat collections and from the sale of UNICEF greeting cards. See UNICEF.

Human Rights. In 1946, the United Nations set up the Commission on Human Rights as part of the Economic and Social Council. The commission wrote the Universal Declaration of Human Rights, which all members of the General Assembly approved in 1948. This declaration expressed the hope that men would learn to respect the rights and dignity of other men. Parts of the declaration have been included in the constitutions of El Salvador, Haiti, Indonesia, Jordan, Libya, Puerto Rico, and Syria.

Racial problems have received more attention than any others brought before the UN. These problems—and those of colonialism and economic development—are the main concern of the Asian and African delegates, who make up a majority in the UN. In 1965, the General Assembly approved a treaty called the International Convention on the Elimination of All Forms of Racial Discrimination. The treaty went into effect in 1969, after the governments of 27 nations had approved it. Similar UN treaties deal with slavery, the rights of refugees, and the crime of *genocide* (elimination of an entire national, racial, or religious group).

Peaceful Uses of Nuclear Energy. In 1953, President Dwight D. Eisenhower of the United States suggested to the General Assembly that governments contribute nuclear materials to an international agency. This agency would use such materials to help develop peaceful uses for the atom.

In 1957, the UN set up the agency that Eisenhower had suggested. The International Atomic Energy Agency (IAEA) is separate from the UN but works closely with it. Its main responsibility is to encourage peaceful uses of the atom. The agency must also make certain that no nuclear materials entrusted to it by member nations are used for making weapons. It has developed controls over its atomic materials and conducts about 500 inspections of nuclear facilities in more than 35 countries yearly. All the nuclear projects of IAEA members in Latin America, Asia, and the Pacific area operate under IAEA safeguards. A treaty prohibiting the spread of nuclear weapons went into effect in March, 1970. The IAEA is responsible for inspections that make certain the treaty is not broken.

The IAEA cooperates with many other agencies to encourage the sharing of nuclear information. It also encourages research and experiments dealing with atomic fuels, atomic medicine, *desalination* (removing the salt) of seawater, and other uses of nuclear energy. Money for IAEA projects comes from dues paid by member nations and from voluntary contributions.

Controlling the Environment. The United Nations, like many other organizations, has called attention to air and water pollution and other dangers that threaten man's environment. The Economic and Social Council, together with several specialized agencies, studied these problems and made recommendations to the General Assembly. In December, 1968, the Assembly passed a resolution pledging the UN to work for solutions to problems concerning the environment. The UN Conference on Human Environment met in 1972 to discuss ways in which UN members could cooperate to protect the environment. As a result of the conference, the General Assembly established the United Nations Environment Program in 1972. The program encourages international cooperation to fight pollution and preserve the earth's natural resources.

Fighting Hunger has always been a major goal of the UN. The Food and Agriculture Organization of the United Nations (FAO), a specialized agency, was established in 1945. It works to improve the production and distribution of food and other agricultural products. The World Food Program began in 1962 as a joint project of the UN and FAO. It provides emergency food aid and other assistance to developing countries.

In the 1970's, food production in many countries fell behind population growth. As a result, large numbers of people suffered from severe malnutrition. In 1974, the UN World Food Conference met in Rome to discuss the food shortage. This conference established a new UN agency, the World Food Council. The council coordinates the delivery of about 10 million tons of food sent to developing nations every year. It also accumulates world food reserves for use in time of famine. The council works through other agencies that deal with the supply of food, including the FAO, the United Nations Development Program (UNDP), and UNICEF. The Rome conference also created an international warning system to detect future food shortages.

Graduate Medical Students in Burma receive specialized training under the United Nations Development Program (UNDP). This program helps nations develop their human and natural resources.

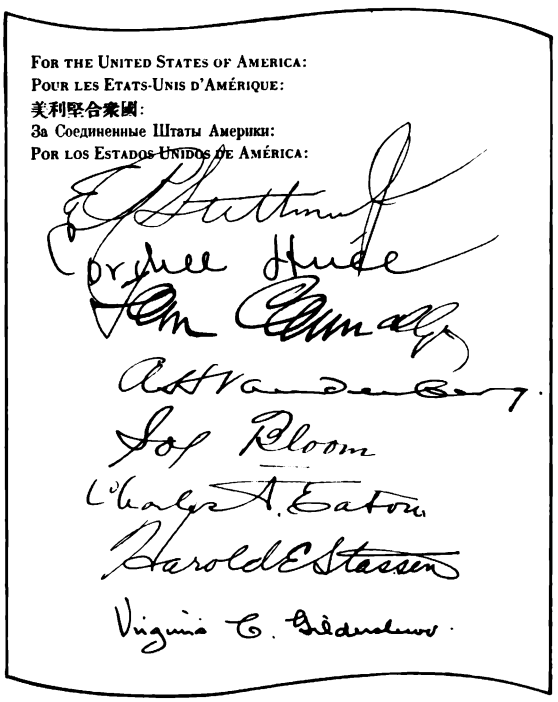
Early in World War II, the representatives of nine European governments fled to London. Nazi Germany had conquered much of Europe and had driven these leaders from their homelands. Representatives of Great Britain and the Commonwealth nations met in London with leaders of Belgium, Czechoslovakia, France, Greece, Luxembourg, The Netherlands, Norway, Poland, and Yugoslavia. On June 12, 1941, all these nations signed a declaration pledging to work for a free world, where people could live in peace and security. This pledge, usually called the *Inter-Allied Declaration*, was the first step toward building the UN.

The Atlantic Charter followed the Inter-Allied Declaration by two months. It was signed by President Franklin D. Roosevelt of the United States and Prime Minister Winston Churchill of Great Britain. The charter expressed the hope of the two leaders for a world where all people could live free from fear and need. It also expressed their intention to seek eventual disarmament and economic cooperation for the benefit of all. See ATLANTIC CHARTER.

On Jan. 1, 1942, representatives of 26 nations signed the *Declaration by United Nations*. This was the first official use of the words *United Nations*. The declaration approved the aims of the Atlantic Charter and was later signed by 21 other nations.

On Oct. 30, 1943, representatives of China, Great Britain, Russia, and the United States signed the *Moscow Declaration on General Security*. This declaration approved the idea of an international organization for preserving world peace. A month later, Roosevelt, Churchill, and Premier Joseph Stalin of Russia met at Teheran, Iran. The three men declared that they recognized the responsibility of all the United Nations to achieve lasting peace. See TEHERAN CONFERENCE.

The Dumbarton Oaks Conference. From August to October, 1944, representatives of China, Great Britain, Russia, and the United States held a series of meetings at the Dumbarton Oaks estate in Washington. The goal of these meetings was to plan a peacekeeping organization. The four nations succeeded in drawing up a basic plan, though they could not agree on some important questions. The plan's main feature was a Security Council on which China, France, Great Britain, Russia, and the United States would be permanently



The UN Charter was signed by 50 nations at the San Francisco Conference. These are the signatures of the U.S. delegates.

IMPORTANT DATES IN UN HISTORY

1945 (April 25) The San Francisco Conference opened.
1945 (June 26) The UN Charter was signed by delegates at the San Francisco Conference.
1945 (Oct. 24) The UN was born as the required number of nations approved the charter.
1946 (Jan. 10) The 51-member General Assembly met in London.
1946 (Feb. 14) The UN voted to have its headquarters in the United States.
1948 (Dec. 10) The UN approved the Universal Declaration of Human Rights.
1949 (Dec. 27) The Netherlands granted independence to Indonesia as the result of UN efforts.
1949 (Feb.-July) Israel and the Arab states signed cease-fire agreements worked out by UN officials.
1950 (June 27) The Security Council approved sending UN troops to protect Korea's independence.
1953 (July 27) North Korea and the UN signed a truce agreement.
1956 (Nov. 6) The UN arranged an Israel-Egypt cease-fire agreement in the Suez Canal dispute.
1960 (July 14) The Security Council approved sending UN forces to Congo (Léopoldville) to keep order.
1960 (Dec. 14) The General Assembly adopted a Declaration on the Granting of Independence to Colonial Countries and Peoples.
1962 The UN issued $200-million worth of bonds to help pay its debts.
1964 (March 4) The Security Council approved a peacekeeping force for Cyprus.
1965 UNICEF was awarded the Nobel peace prize.
1966 (Dec. 16) The Security Council voted economic sanctions against Rhodesia.
1967 (June) The Security Council arranged cease-fire agreements, ending the six-day Arab-Israeli war.
1968 (June) The General Assembly endorsed a treaty designed to stop the spread of nuclear weapons.
1968 The General Assembly resolved to attack worldwide problems of air and water pollution.
1970 The UN observed its 25th anniversary.
1971 The General Assembly voted to expel Nationalist China and admit Communist China to the UN.
1973 War broke out in the Middle East and the UN helped arrange a partial cease-fire.
1975 The General Assembly declared 1975 as International Women's Year to promote equality between women and men.

represented. The permanent members would have the power to veto decisions approved by the rest of the Council. See DUMBARTON OAKS.

In February, 1945, Roosevelt, Churchill, and Stalin met at Yalta in the Crimea. At this meeting, they agreed that some minor actions of the Security Council could not be vetoed by the permanent members. The three leaders announced that a conference of United Nations would open in San Francisco on April 25, 1945. This conference would use the plan worked out at Dumbarton Oaks to help prepare a charter for the United Nations.

The San Francisco Conference. Delegates from 50 nations met in San Francisco for the United Nations Conference on International Organization. The conference opened on April 25, 1945, 13 days after the death of President Roosevelt and 12 days before the surrender of Germany. Victory over Japan was still four months away.

At the conference, some major disagreements arose between the Big Three (Great Britain, Russia, and the United States) and the smaller, less powerful nations. The Big Three believed they could guarantee future peace only if they continued to cooperate as they had during the war. They insisted that the UN Charter should give them the power to veto actions of the Security Council. The smaller nations opposed the veto power but could not defeat it. They did succeed in adding to the importance of other UN organs, such as the General Assembly and the Economic and Social Council. In these bodies, responsibilities could be shared more equally than in the Security Council. Such efforts by smaller nations helped create an organization that had far-reaching powers and responsibilities.

On June 26, 1945, all 50 nations present at the conference voted to accept the charter. Poland had been unable to attend but later signed the charter as an original member. The charter then had to be approved by the governments of the five permanent members of the Security Council and of a majority of the other nations that signed it. The charter went into effect on Oct. 24, 1945, a date that is celebrated every year as United Nations Day.

Building UN Headquarters. The first session of the General Assembly opened in London early in 1946. The delegates took up the question of where the permanent headquarters of the United Nations should be located. They considered invitations from various countries and finally agreed that the headquarters should be in the United States. On Dec. 14, 1946, the Assembly accepted a gift of $8½ million from John D. Rockefeller, Jr., of the United States to buy 18 acres (7 hectares) of land along the East River in New York City. The city itself donated additional land in the area. In 1947, the General Assembly approved plans for the headquarters buildings. The next year, the Congress of the United States approved an interest-free loan of $65 million for their construction. The buildings were completed in the fall of 1952.

The Signing of the Charter took place on June 26, 1945. President Harry S. Truman, *left*, stood by as Secretary of State Edward R. Stettinius, Jr., signed for the United States.

The Indonesian Dispute. In July, 1947, fighting broke out in Indonesia between the Republic of Indonesia and The Netherlands. Indonesia had been a Dutch colony before Japanese troops occupied the country during World War II. The Dutch wanted to regain control after the war, but the Indonesians demanded independence.

The Security Council took up the question and on Aug. 1, 1947, called for a cease-fire. On Jan. 17, 1948, a committee appointed by the Council persuaded Indonesia and The Netherlands to sign a cease-fire agreement. But in December, 1948, The Netherlands announced that it no longer accepted the agreement. Fighting broke out again.

On Jan. 28, 1949, the Security Council approved a plan for an independent Indonesia and set up the UN Commission for Indonesia. The commission arranged another cease-fire agreement in August, 1949, and brought the two sides together for a conference at The Hague in The Netherlands. After this conference, The Netherlands granted independence to the United States of Indonesia on Dec. 27, 1949. The new nation included all the Netherlands Indies except West New Guinea (now Irian Jaya).

The Netherlands wanted to continue ruling West New Guinea until its people could decide their future. But Indonesia claimed it had inherited West New Guinea as part of the Netherlands Indies. In December, 1961, fighting broke out between Dutch and Indonesian forces. Acting Secretary-General U Thant, worried over the possibility of war, brought the two sides together for talks. In August, 1962, The Netherlands and Indonesia agreed to let the UN govern the area until May, 1963, when Indonesia would take control. They also agreed that in 1969, Indonesia would let the people vote on their future. As a result of the 1969 vote, West New Guinea remained part of Indonesia.

The India-Pakistan Conflict. In January, 1948, the Security Council sent a commission to try to settle a war between India and Pakistan. The two nations had gone to war in 1947 over the region of Kashmir, which both claimed. After a year of effort by the UN commission, India and Pakistan agreed to let the people of Kashmir vote on the question. The two sides approved a cease-fire line in July, 1949. But the UN could not persuade either side to remove enough troops from the area to assure peaceful voting.

Fighting broke out again between India and Pakistan in August, 1965. One of the causes of this war was again the question of Kashmir. In September, the Security Council demanded that both nations stop fighting and withdraw their forces to the 1949 cease-fire line. The secretary-general met with both sides, and a cease-fire was finally arranged on Sept. 20, 1965. Two separate UN observer groups were given the responsibility of keeping the cease-fire in effect. In January, 1966, Russia persuaded India and Pakistan to sign an agreement pledging to give up the use of force in the dispute. The dispute itself was not settled, and the UN observer groups continued to enforce the cease-fire.

The Arab-Israeli Wars. In 1947, the General Assembly approved a plan to divide Palestine into a Jewish state and an Arab state. The city of Jerusalem would be governed by the United Nations. The Arabs opposed the plan and fighting broke out between Arabs and Jews. Nevertheless, the state of Israel was born on May 14, 1948. That same day, armies from Egypt, Iraq, Lebanon, Syria, and Transjordan (now Jordan) invaded Israel.

The General Assembly and the Security Council both tried to stop the fighting. On May 20, 1948, the Assembly sent Count Folke Bernadotte of Sweden to try

Peacekeeping Forces, such as this one in Cyprus, are set up by the UN to help prevent fighting in troubled areas. The UN has also sent peacekeeping forces to the Congo and the Middle East.

to make peace. He was shot and killed in Jerusalem a few months later. His assistant, Ralph J. Bunche of the UN Secretariat, replaced him. By July, 1949, Bunche had arranged cease-fire agreements between Israel and each of its Arab neighbors. Bunche won the 1950 Nobel peace prize for his achievement.

The cease-fire agreements did not establish boundaries between Israel and the Arab states. They stated only that the two sides would not go beyond the points they occupied when the fighting stopped. When the cease-fire went into effect, Israel occupied more territory than had been approved by the United Nations in 1947. Jerusalem was divided, and many Arabs had become refugees in neighboring Arab countries. The cease-fire agreements called for UN groups representing both Arabs and Israelis to report any new fighting. The UN set up the United Nations Truce Supervision Organization to investigate any such reports.

The truce organization worked effectively for several years, but no progress was made toward lasting peace. Israel would not take back the Arab refugees, and the Arabs blockaded Israeli ships in the Suez Canal and the Gulf of Aqaba. In 1955, Arabs from Egypt began terrorist raids against Israel. Israel returned the attacks. That same year, Egypt arranged to buy arms from Communist countries. This action alarmed the Israelis and also the British and French, who had interests in the region. In July, 1956, Egypt seized the Suez Canal from its British and French owners.

Great Britain and France tried unsuccessfully to reach an agreement with Egypt. They then asked the Security Council to act. But Israeli troops invaded Egypt before the Council had reached a decision. Great Britain and France then vetoed action by the Security Council and sent forces to defend the Suez Canal. The General Assembly, meeting in emergency special session, called for a cease-fire, which was finally achieved on Nov. 6, 1956. The Assembly agreed that UN troops should guard the borders between Israel and Egypt. A United Nations Emergency Force (UNEF) was organized, and 10 UN members furnished troops. On November 15, the first UNEF troops arrived in Egypt to observe the cease-fire. In March, 1957, Israel withdrew its forces behind the 1949 cease-fire lines.

The 1956 cease-fire did not lead to peace. Russia supplied arms to the Arab countries, and Western nations supplied them to Israel. UNEF troops guarded the border between Egypt and Israel, but the Arabs raided Israel from Jordan and Syria. Israeli forces raided those countries in return.

In May, 1967, Egypt demanded that the UN withdraw its forces from Egyptian territory. The secretary-general yielded to the demand, and Egyptian troops took the place of UNEF troops along the Israeli border. Egypt once again blockaded Israeli ships in the Gulf of Aqaba. On May 30, Jordan signed a military agreement with Egypt. On June 5, Israel attacked Egypt, Jordan, and Syria. The Security Council called for an end to the fighting, but the two sides did not agree to a cease-fire until June 10. By that time, Israel had seized more Arab territory, including Jerusalem, the Gaza Strip, the Golan Heights, and the Sinai Peninsula. Israel also gained control of the entry to the Gulf of Aqaba.

In November, 1967, the Security Council called on Israel to give up all Arab territory occupied in June and accept a promise of secure borders in return. Secretary-General Thant appointed Gunnar V. Jarring of Sweden to conduct peace talks with the Arabs and Israelis. But Jarring could accomplish little. Both sides continued to raid and to build up arms supplies.

In October, 1973, full-scale war broke out again. Major battles occurred in the Sinai Peninsula and in the Golan Heights in Syria. Cease-fires ended most of the fighting by November. In January, 1974, Egypt and Israel agreed to a separation of their forces in the Sinai Peninsula. Syria and Israel reached a similar agreement on the Golan Heights in May. The UN established two new international peace-keeping forces to supervise the separation of troops on both fronts. These two forces were the United Nations Disengagement Observer Force (UNDOE) and the United Nations Emergency Force II (UNEF II).

In 1974, the UN invited Palestinian leader Yasir Arafat to open a two-week debate on the status of the Palestinian people. Arafat was chairman of the Palestine Liberation Organization (PLO), a group representing the Palestinian Arabs. After the debate, the General Assembly adopted a resolution recognizing the Palestinians' right to nationhood. A second resolution gave the PLO *observer status*—that is, the right to attend Assembly sessions but not to take part.

The Korean War. At the end of World War II, Russian troops occupied Korea north of the 38th parallel and United States troops occupied it to the south. In 1947, the UN appointed a commission to find ways to unite the country and form a national government. The northern part of Korea refused to take part in this plan. But elections were held in the south and the Republic of Korea was set up. In 1948, the General Assembly declared that the government of the Republic of Korea (South Korea) was the only legal government.

On June 25, 1950, Communist armies from North Korea invaded the Republic of Korea. The Security Council met immediately and called on North Korea to withdraw its forces. Two days later, the Council voted to ask members of the UN to send troops to assist South Korea. Russia could not veto the Council's action because it had temporarily withdrawn its delegate to protest Nationalist China's membership on the Council.

On July 7, 1950, the Council formed a UN military command under the leadership of the United States. Of the 60 UN members, 16 sent troops to Korea and 41 sent supplies. But the United States contributed more than 95 per cent of the men and supplies.

In October, 1950, Chinese Communist forces entered the war. The Security Council met to discuss the situation, but the Russian delegate had returned and vetoed any attempt of the Council to act. The General Assembly then accused the Chinese Communists of attacking the Republic of Korea. The Chinese ignored the Assembly's demands that they withdraw their forces. The fighting finally ended on July 27, 1953, when North Korea and the United Nations signed a cease-fire agreement. See KOREAN WAR.

Conflict on Cyprus. In 1954, Greece informed the UN that it supported the demand of Cyprus to decide its own political future. The island was then under British rule. About 80 per cent of its people are Greek, and most of the rest are Turkish. The two groups oppose each other strongly. Some of the Greeks on the island demanded that Cyprus become a part of Greece. The General Assembly discussed the Cyprus situation in 1954 and in following years, but took no action.

By February, 1957, disturbances between the Greeks and Turks on Cyprus had become so serious that the General Assembly urged Britain, Greece, and Turkey to find a solution. The three nations worked out a plan that was accepted by both groups. On Aug. 16, 1960, Cyprus became an independent republic. Britain, Greece, and Turkey guaranteed its independence.

In December, 1963, President Makarios of Cyprus withdrew some rights of the Turkish population. Turkey's fleet appeared off the island, and Cyprus appealed to Russia for help. Cyprus also joined Great Britain in seeking assistance from the Security Council. In March, 1964, the Council approved the creation of a UN military force to keep peace between the Greeks and Turks on Cyprus. This force, supported by voluntary contributions from UN members, helped prevent further conflict during the 1960's and early 1970's.

In July, 1974, conflict between the Greeks and Turks broke out again. Cypriot troops led by Greek army officers overthrew Makarios. Turkey claimed that Greece had violated the independence of Cyprus, and Turkish troops invaded the island. The Security Council called for a cease-fire, and both sides agreed to one after several days of fighting. A civilian government replaced the military rulers, and peace talks began. But the talks collapsed in mid-August, and Turkish forces attacked again. Turkey seized over a third of the island before agreeing to a new cease-fire. See CYPRUS (History).

Disturbance in Lebanon. In May, 1958, Lebanon accused Egypt and Syria of aiding groups that were trying to overthrow its government. Lebanon asked the Security Council for assistance. The Council sent military observers to investigate. Lebanon also asked the United States for help. In July, the United States sent about 10,000 marines to Lebanon to help keep order.

The UN observers reported that the forces opposing the Lebanese government were receiving little aid from outside the country. The United States withdrew its forces, and the UN group left Lebanon by the end of 1958. See LEBANON (History).

The Congo Emergency. On June 30, 1960, Congo (Léopoldville)—now Zaire—became an independent republic after 55 years of Belgian rule. As the Belgian administrators and army withdrew, riots broke out. A complete breakdown threatened the country. Belgian troops returned to keep order. See ZAIRE (Independence).

The Congolese government asked the United Nations for military assistance. The Security Council gave the secretary-general the power to send military aid and called on Belgium to withdraw its troops. The secretary-general set up a force made up of both military and nonmilitary units supplied by African and other UN members. During the months that followed, Russia vetoed further action by the Security Council, and the General Assembly took over the Congo operation.

The UN force helped the Congolese government regain control of the country, and order was restored. The UN withdrew its force on June 30, 1964.

The UN force in the Congo totaled 20,000 men at its peak. The total cost of supporting this force was nearly $400 million, and another $50 million was spent on economic aid for the Congolese. France, Russia, and several other UN members refused to pay their share of these expenses. They argued that only the Security Council could make assessments for peacekeeping. The Congo assessments had been made by the General Assembly. In a short time, the UN ran deeply into debt, and its ability to meet future emergencies was seriously weakened. See the *Finances* section of this article.

The Cuban Missile Crisis. On Oct. 22, 1962, President John F. Kennedy of the United States told the world that Russia was building secret missile bases in Cuba. Russian ships were bringing the missiles and the equipment for these bases. The missile bases could launch atomic attacks on the United States and other nations from Cuba, which lies only 90 miles (145 kilometers) from Florida. Kennedy demanded that Russia remove all the missile bases and missiles from Cuba, and he announced a naval *quarantine* (blockade) of Cuba. He asked both the Organization of American States (OAS) and the UN Security Council to act.

Acting Secretary-General U Thant immediately began to seek ways to avoid a head-on clash between the two powers. On October 24, Thant announced that he had suggested various actions for both Russia and the United States to settle the dispute.

Several days later, Russia ordered its ships not to proceed to Cuba. The United States in turn promised to do everything possible to avoid war. On October 28, Russian Premier Nikita S. Khrushchev agreed to Kennedy's demands. Russia and the United States then agreed that the UN should supervise the removal of the missiles and missile bases. But Thant could not persuade Cuba to accept UN inspectors. See CUBA (The Cuban Missile Crisis).

The Problem of Southern Africa has been especially difficult for the United Nations. Southern Africa is the only region in the world where countries with a large majority of blacks are still ruled by small numbers of whites. These countries are Rhodesia, South Africa, and South West Africa. Rhodesia was a British colony until 1965, when it became independent. South Africa is an independent country and a UN member.

Some UN members have urged that the UN take military action against the white governments of southern Africa. Some have suggested that South Africa be expelled from the UN. But most members prefer a different kind of action.

The UN has taken action against South Africa, which enforces *apartheid*, the separation of the races. Almost all UN members oppose apartheid, and the General Assembly has frequently spoken out against it. In 1962, the Assembly set up a special committee to deal with the situation in South Africa. The next year, the Security Council declared that apartheid threatened world

peace and security. It urged UN members not to supply South Africa's rulers with weapons or other materials that could be used against the black population. In 1974, the General Assembly excluded South Africa's delegation from that year's session because of the nation's apartheid policy. This action deprived South Africa of the right to speak or vote at the session.

The UN has also taken action against Rhodesia. When Rhodesia declared its independence, it did so without British approval and without granting civil rights to its black majority. For the first time, the UN approved economic *sanctions* (penalties) against a country. In 1966, it ordered UN members to stop trading with Rhodesia and to halt weapon shipments to the Rhodesian government. The sanctions have been only partially effective, chiefly because Portugal and South Africa supply Rhodesia with most of the goods it needs.

In 1966, the General Assembly voted to set up a UN council to govern South West Africa, which it renamed Namibia. The council would govern until South West Africa was ready for independence. The League of Nations had given control of South West Africa to South Africa, which refused to make it a UN trust territory. South Africa has refused to let the UN council enter South West Africa and has started apartheid there.

Arms Control. The UN Charter mentions only briefly the need for arms control. But the charter was written before the nuclear age began. By 1949, both Russia and the United States had atomic bombs. They agreed that controls were needed for such weapons, but they could not agree on what kind of controls. So long as the two nations could not agree, the UN was unable to deal with the problem of disarmament. But it studied the problem, and the General Assembly issued many appeals for nations to reduce their arms production.

In 1961, Russia and the United States agreed on a plan to establish a disarmament committee. The UN approved the plan, and the Eighteen-Nation Disarmament Committee (ENDC) was set up. More nations were added in 1969, and the group became the Conference of the Committee on Disarmament. Its goal is total disarmament, but progress has been slow.

The Cuban missile crisis of 1962 convinced both Russia and the United States to work harder for control of nuclear weapons. In 1963, the two nations, along with Great Britain, signed a treaty outlawing nuclear tests in the atmosphere, in outer space, and under water —but not underground. They also agreed not to put weapons of mass destruction in orbit around the earth.

Following the 1963 treaty, the ENDC increased its efforts to control arms. It was responsible for the *nonproliferation treaty* of 1968. This treaty prohibits the nuclear powers that signed and ratified it—Great Britain, Russia, and the United States—from giving nuclear weapons to nations that do not already have them. It also prohibits nations without atomic weapons from acquiring them. China, France, and India have nuclear weapons but refuse to sign the treaty. The treaty went into effect on March 5, 1970, after being approved by the governments of 43 nations.

In December, 1971, the UN General Assembly approved a treaty that prohibits the production and stockpiling of biological weapons. The treaty became effective on March 26, 1975.

Pictorial Parade

The Nuclear Test Ban Treaty was signed in 1963 by Great Britain, Russia, and the United States. It resulted from proposals made by members of the UN's Disarmament Committee.

Peaceful Uses of Outer Space. The beginning of the space age created a need for laws governing the exploration and use of outer space. In 1958, the UN secretary-general called on all nations to agree not to claim territory in outer space. The General Assembly declared in 1963 that outer space should be used for the benefit of all mankind and that no nation could claim any part of it. In 1967, Great Britain, Russia, and the United States signed a treaty on the exploration and uses of outer space. This agreement included the principles set forth by the General Assembly in 1963.

The UN asks member nations to share scientific information on outer space. It encourages the training of space scientists and engineers, and it studies ways that space programs can benefit developing countries.

Peaceful Uses of the Seabed. The question of uses of the seabed came before the General Assembly for the first time in 1967. The Assembly noted that various inventions allowed industry, science, and the military to use the seabed in new ways. These inventions included machinery for removing valuable minerals from the seabed and equipment for setting up underwater military bases. The Assembly appointed a permanent 42-nation committee to study the problem. The committee agreed that a large area of the seabed should be beyond the control of individual nations. The group declared that this area should be used only for peaceful projects and for the benefit of all mankind. In 1971, the UN worked out a treaty barring the testing or use of nuclear weapons from the seabed beyond a 12-nautical-mile (22-kilometer) coastal zone. The treaty went into effect in 1972, after 22 national governments had approved it.

Peacekeeping Difficulties. The UN has only limited ability to maintain peace. Its members have never been able to agree on a permanent police force to deal with international disputes. The UN's financial troubles also make the organization unable to do an effective job of peacekeeping. Some nations blame Russia for the UN's failures in keeping the peace, and others blame the United States. But most nations have been unwilling to carry out UN recommendations when they feel these recommendations are not in their own interest.

Nor do UN members agree on what the UN's peacekeeping function should be. Powerful members, such as Russia and the United States, prefer to use their own forces to deal with certain types of conflicts. Some members, especially those from Asia and Africa, think UN peacekeeping should be concerned mainly with fighting racial discrimination in Rhodesia and South Africa.

Finances. Every UN member is expected to pay a share of the organization's day-by-day expenses. The amount each member pays depends on its ability to pay. According to UN rules in the early 1970's, no member could pay more than 30 per cent or less than 0.04 per cent of the UN's ordinary expenses. But in 1972, the maximum contribution was reduced to 25 per cent at the request of the United States, the only member paying that much. At the same time, the minimum contribution was lowered to 0.02 per cent.

The UN has been seriously weakened by a debt that once reached $134 million. But its financial problem involves more than money. The members do not agree on what UN organ should conduct and finance peacekeeping operations. The International Court of Justice ruled in 1962 that all UN members should share the cost of peacekeeping operations in the Middle East and the Congo. The General Assembly approved the funds for these operations. But Russia and other Communist countries, along with France, have refused to pay their peacekeeping assessments. They claim that only the Security Council can make these assessments.

In 1964, Russia fell two years behind in some of its UN payments. The charter states that such a member "shall have no vote." The United States tried to enforce this rule but could not win the support of a majority of other members. A special committee set up in 1965 and a special session of the General Assembly in 1967 made no progress toward solving the UN's financial problems. The organization has avoided bankruptcy by tight control of expenses, a $200-million bond issue in 1962, and a voluntary "rescue fund" started in 1964.

Membership Questions. Most nations are UN members. The question of membership for Communist China came up at every General Assembly session from 1950 to 1971. Until 1971, the Assembly refused to admit Communist China because seating the Communists would mean ending Nationalist China's membership. But in October, 1971, the Assembly voted to expel the Nationalists and admit Communist China to the UN.

Nations join the UN for various reasons. Membership gives some nations a place in the international community that they might not otherwise have. Some of these nations are so small that they cannot afford their own embassies. Through one mission at the UN, they can keep in contact with most of the world's governments. UN membership enables these nations to bring their problems to public attention and to take part in UN programs of economic and technical assistance.

The presence of many small nations in the UN has also created some problems. The vote of the smallest state counts the same as the vote of the largest. Some nations have suggested that very small countries be given less than a full vote after joining the UN.

Only one nation—Indonesia—has ever withdrawn from the UN. Indonesia rejoined less than two years later. Most countries appear unwilling to try to get along without the UN. They also realize the value of international effort in dealing with certain kinds of economic and social problems. Above all, members understand that UN peacekeeping and peacemaking can help prevent a third world war. LINCOLN P. BLOOMFIELD

UNITED NATIONS / Study Aids

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UN AGENCIES

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Human Rights, Universal Declaration of
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L. Peaceful Uses of the Seabed
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Questions

How many UN member nations are represented in the General Assembly?
What are the two main goals of the UN?
What are the duties of the secretary-general?
How does voting in the Security Council differ from voting in other UN organs?
What are the two main differences between the UN and the League of Nations?
What are the official languages of the UN?
Which UN organ works with the specialized agencies?
What nations are permanent members of the Security Council?
Why was the Dumbarton Oaks Conference held?
Has any nation ever withdrawn from the UN?

Reading and Study Guide

See *United Nations* in the RESEARCH GUIDE/INDEX, Volume 22, for a *Reading and Study Guide.*

UNITED NATIONS CHILDREN'S FUND. See UNICEF.

UNITED NATIONS DAY is October 24. It commemorates the date in 1945 that the required number of nations signed the United Nations Charter, officially establishing the UN. In the United States, the President issues a proclamation urging citizens, communities, government officials, and organizations to plan UN Day programs. In Canada, the prime minister issues a statement, and many communities plan observances.

UNITED NATIONS DEVELOPMENT PROGRAM. See FOREIGN AID (Technical Assistance and Relief); UNITED NATIONS (Working for Progress).

UNITED NATIONS EDUCATIONAL, SCIENTIFIC, AND CULTURAL ORGANIZATION. See UNESCO.

UNITED NATIONS RELIEF AND REHABILITATION ADMINISTRATION (UNRRA) was set up in 1943 by 44 nations to relieve the suffering caused by World War II. UNRRA started its work in Italy. It began operating on a large scale in 1944 and accomplished its greatest work in the two years after the war. UNRRA officials shipped livestock to devastated areas, helped revive agriculture, rebuilt industries, and distributed food to millions of needy persons. It officially ended its work in 1947. See also REFUGEE. FIORELLO H. LA GUARDIA

UNITED PRESBYTERIAN CHURCH IN THE U.S.A. is the largest Presbyterian denomination in America. The church emphasizes the application of Christian faith to every area of life, the denomination's mission in spreading that faith, an educated membership, and the *ecumenical* (Christian unity) movement. The church sponsors missionary projects throughout the world and operates 46 colleges and universities and 7 graduate theological seminaries in the United States.

The denomination traces its beginning in America to 1640, when the first Presbyterian congregation was established on Long Island. The United Presbyterian Church in the U.S.A. was created in 1958 by a merger of the Presbyterian Church in the U.S.A. with the United Presbyterian Church of North America. For U.S. membership, see RELIGION (table [Presbyterians]).

Critically reviewed by the UNITED PRESBYTERIAN CHURCH IN THE U.S.A.

See also PRESBYTERIANS.

UNITED PRESS INTERNATIONAL (UPI) is one of the largest independent news agencies in the world. It distributes news, photographs, television news film, and recorded radio news to about 6,500 clients. Its clients include newspapers, radio and television stations, and news magazines in more than 100 countries. UPI has about 250 bureaus, including about 140 in the United States. It employs over 10,000 persons, and leases over 500,000 miles (800,000 kilometers) of wires. It sends out dispatches in 48 languages.

Subsidiaries include United Features Syndicate, United Press International of Canada, Ltd., and United Press International (U.K.), Ltd., in Great Britain. It operates a television film service, UPI Newsfilm, Inc. UPI was formed in May, 1958, when United Press and International News Service merged. WILLIAM C. PAYETTE

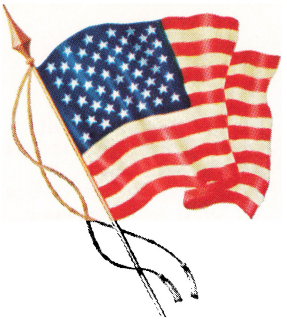
See also INTERNATIONAL NEWS SERVICE.

UNITED SERVICE ORGANIZATIONS (USO) is a federation of six voluntary agencies. Through these agencies, civilians serve the educational, religious, social, spiritual, and welfare needs of members of the armed forces in the United States and overseas.

The USO maintains recreation centers and organized entertainment for servicemen. There are about 90 United Service Organizations operations in the United States, and more than 40 overseas. Each year, about 120,000 volunteers contribute time to USO. Service men and women pay about 20 million visits to USO clubs and centers each year. Founded in 1941, the USO has headquarters at 237 E. 52nd St., New York, N.Y. 10022. Critically reviewed by USO

UNITED SOCIETY OF BELIEVERS. See SHAKERS.

UNITED STATES



D. Hallinan, FPG

Statue of Liberty in New York Harbor

UNITED STATES OF AMERICA is the fourth largest country in the world, both in area and population. The United States covers the full width of the North American continent, from the Atlantic Ocean to the Pacific Ocean. It also includes Alaska on the edge of the Arctic, and tropical Hawaii far out in the Pacific.

The land of the United States is as varied as it is vast. It ranges from the warm beaches of Florida to the frozen northlands of Alaska, and from the level Midwest prairies to the snow-capped Rocky Mountains. The United States is the land of the spectacular Grand Canyon, the mighty Mississippi River, and thundering Niagara Falls.

This huge and beautiful country is unbelievably rich in resources. The United States has great stretches of some of the most fertile soils on earth. It has plentiful water supplies. And it has a great treasure house of minerals, including coal, copper, iron, natural gas, and oil.

Until about 300 years ago, what is now the United States was largely a wilderness. People in Europe saw in this great, almost empty land a chance to build new and better lives. They came, thousands upon thousands, from many countries. They brought different skills and different ideas. They also brought the ideals of freedom and equality. They established a government designed to protect the liberty of every man. They wrote a Constitution guaranteeing freedom of speech, of religion, of political belief, and of the press.

The great size and wealth of the land has challenged every generation of Americans since the days of the first colonists. Freedom of thought and action has led each succeeding generation to accept the challenge and make the country advance. When mountains blocked the way, Americans built their roads and railroads around them or through them. When floods threatened their farms and cities, Americans built dams and levees to hold back the waters. In areas where rainfall was too light to raise crops, Americans built great irrigation systems. To reach across their vast country, Americans created huge transportation and communication systems.

Expressway Interchange near Downtown Chicago

Robert H. Glaze, Artstreet

The United States is still changing and expanding. Its great cities are growing both upward and outward. The towering skylines of the cities change frequently as Americans build, tear down, and rebuild. The nation's busy factories turn out the greatest abundance of goods in the world. The farms of the United States are the most productive on earth.

The arts and sciences have also flourished in this land of enormous wealth. The American way of life inspired the music of George Gershwin, the literature of Mark Twain and Sinclair Lewis, and the architecture of Frank Lloyd Wright. The United States produced nuclear energy, the telephone, the hot dog, and Salk vaccine. The first human beings to set foot on the surface of the moon were Americans.

The United States has given its people the highest standard of living in the world. But more important, it has tried to give every American freedom and equality of opportunity. The United States is often called the *U.S.*, *U.S.A.*, or *America*.

This article tells of the land and its resources, and of the people and their accomplishments. For detailed discussions of U.S. government and history, see UNITED STATES, GOVERNMENT OF THE; and UNITED STATES, HISTORY OF THE.

This article was contributed by John Gunther, author of Inside U.S.A. *It was critically reviewed by Jewell A. Phelps, Dean of the Undergraduate College at George Peabody College for Teachers.*

Fertile Fields in California's Imperial Valley

Carlos Elmer, Shostal

FACTS IN BRIEF

Capital: Washington, D.C.

Form of Government: Republic. *Chief of State*—President, elected to a four-year term. *Congress*—Senate, 100 members, 2 from each state, elected to six-year terms; House of Representatives, 435 members, varying number from each state according to population, elected to two-year terms.

Area: 3,615,122 sq. mi. (9,363,123 km²), including 78,267 sq. mi. (202,711 km²) of inland water but excluding 60,788 sq. mi. (157,440 km²) of Great Lakes and Lake Saint Clair and 13,942 sq. mi. (36,110 km²) of coastal water. *Greatest Distances Excluding Alaska and Hawaii*—east-west, 2,807 mi. (4,517 km); north-south, 1,598 mi. (2,572 km). *Greatest Distances in Alaska*—north-south, about 1,200 mi. (1,930 km); east-west, about 2,200 mi. (3,540 km). *Greatest Distance in Hawaii*—northwest-southeast, about 1,610 mi. (2,591 km). *Extreme Points Including Alaska and Hawaii*—northernmost, Point Barrow, Alaska; southernmost, Ka Lae, Hawaii; easternmost, West Quoddy Head, Me.; westernmost, Cape Wrangell, Attu Island, Alaska. *Coastline*—4,993 mi. (8,035 km), excluding Alaska and Hawaii; 12,383 mi. (19,929 km), including Alaska and Hawaii.

Elevation: *Highest*—Mount McKinley in Alaska, 20,320 ft. (6,194 m) above sea level. *Lowest*—Death Valley in California, 282 ft. (86 m) below sea level.

Physical Features: *Longest River*—Mississippi (2,348 mi., or 3,779 km). *Largest Lake Within the United States*—Michigan (22,300 sq. mi., or 57,757 km²). *Largest Island*—island of Hawaii (4,038 sq. mi., or 10,458 km²).

Population: *Estimated 1976 Population*—217,544,000; distribution, 73 per cent urban, 27 per cent rural; density, 60 persons per sq. mi. (23 persons per km²). *1970 Census*—203,235,298. *Estimated 1981 Population*—229,776,000.

Chief Products: *Agriculture*—cattle and calves, corn, cotton, dairy products, greenhouse and nursery products, hogs, poultry and eggs, soybeans, tobacco, wheat. *Manufacturing*—chemicals; clothing; electrical machinery; food and related products; machinery; metals and metal products; paper and related products; printed matter; textiles; transportation equipment. *Mining*—coal, copper, iron ore, natural gas, petroleum, sand and gravel, stone.

Flag: Adopted June 14, 1777.

Motto: *In God We Trust*, adopted July 30, 1956.

National Anthem: "The Star-Spangled Banner," adopted March 3, 1931.

Bird: Bald Eagle, adopted June 20, 1782.

UNITED STATES
Political Map

- National Capital
- State Capital
- Other City or Town
- State Boundary
- River
- Canal

The two-page map shows the forty-eight mainland states of the United States. The small map, at the right, shows the mainland plus Alaska, Hawaii, and all the overseas possessions and territories governed by the United States.

CANADA
90° West Longitude
80° West Longitude
70° West Longitude
50° North Latitude
40° North Latitude
30° North Latitude
20° North Latitude
North
Albany River
Lake Nipigon
Lake of the Woods
Rainy Lake
Lake Superior
Missinaibi
Abitibi
Gouin Reservoir
St. Maurice
Cabonga Reservoir
Peribonca
Lac St.-Jean
Quebec
St. Lawrence River
Ottawa River
Montreal
Ottawa
Gulf of St. Lawrence
PRINCE EDWARD ISLAND
NEW BRUNSWICK
St. John River
Saint John
NOVA SCOTIA
Halifax
Bay of Fundy
QUEBEC
ONTARIO
MAINE
Kennebec River
Augusta
Portland
VERMONT
Burlington
Montpelier
NEW HAMPSHIRE
Concord
Manchester
Boston
MASSACHUSETTS
Worcester
Providence
RHODE ISLAND
Hartford
CONNECTICUT
Bridgeport
NEW YORK
Albany
Syracuse
Rochester
Buffalo
Hudson
Lake Ontario
Toronto
Hamilton
Georgian Bay
Lake Huron
Lake Michigan
Lake Erie
Erie
Allegheny
Jersey City
Newark
New York City
NEW JERSEY
Trenton
PENNSYLVANIA
Harrisburg
Philadelphia
Wilmington
Dover
DELAWARE
MARYLAND
Annapolis
Washington, D.C.
North Atlantic Ocean
MICHIGAN
Grand Rapids
Lansing
Detroit
Toledo
Fort Wayne
OHIO
Cleveland
Akron
Wheeling
Pittsburgh
Columbus
Dayton
Cincinnati
Ohio River
WEST VIRGINIA
Charleston
Huntington
VIRGINIA
Richmond
Newport News
Norfolk
James River
Roanoke
NORTH CAROLINA
Raleigh
Greensboro
Charlotte
Greenville
SOUTH CAROLINA
Columbia
Charleston
Savannah
Atlanta
Macon
GEORGIA
Chattahoochee
Tennessee
Chattanooga
TENNESSEE
Knoxville
Cumberland
Nashville
Kentucky Lake
KENTUCKY
Louisville
Frankfort
Lexington
Evansville
INDIANA
Indianapolis
Wabash
Gary
Fort Wayne
Madison
Milwaukee
Racine
Lansing
MINNESOTA
Duluth
Minneapolis
St. Paul
Minnesota
WISCONSIN
Wisconsin
Mississippi River
IOWA
Des Moines
Cedar Rapids
Rockford
Chicago
Des Moines
ILLINOIS
Springfield
Illinois River
Kansas City
Kansas City
Topeka
Jefferson City
Missouri
MISSOURI
Springfield
St. Louis
Tulsa
ARKANSAS
Fort Smith
Little Rock
Arkansas
Memphis
Mississippi River
Birmingham
ALABAMA
Tombigbee
Alabama
Montgomery
MISSISSIPPI
Meridian
Jackson
Shreveport
Red River
Sabine River
LOUISIANA
Baton Rouge
Houston
Pearl River
Mobile
Biloxi
New Orleans
Tallahassee
St. Johns
Jacksonville
FLORIDA
Tampa
Lake Okeechobee
Miami
Gulf of Mexico
GRAND BAHAMA ISLAND
GREAT ABACO ISLAND
BAHAMAS
ELEUTHERA ISLAND
Nassau
CAT ISLAND
Straits of Florida
ANDROS ISLAND
LONG ISLAND
MAYAGUANA ISLAND
ACKLINS ISLAND
GREAT INAGUA ISLAND
Distance Scale
0 Miles 100 200 300 400
0 Kilometers 300 400 500 600
Havana
CUBA
ISLE OF PINES
Santiago de Cuba
HAITI
Caribbean Sea
Mérida
YUCATÁN
MEXICO
QUINTANA ROO
CAMPECHE
CAYMAN ISLANDS (Great Britain)
JAMAICA
Kingston
Lambert Conformal Conic Projection WORLD BOOK map

GEOGRAPHIC REGIONS

The United States mainland, excluding Alaska, may be divided into seven main geographic regions. The following geographic groupings of states are based on the states' similarities in climate, physical features, economy, people, traditions, and history. Alaska and Hawaii are separate geographic regions. WORLD BOOK has separate articles on each of the 50 states and on the regions listed below.

Middle Atlantic States

New Jersey, New York, Pennsylvania

Midwestern States

Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin

New England

Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

Pacific Coast States

California, Oregon, Washington

Rocky Mountain States

Colorado, Idaho, Montana, Nevada, Utah, Wyoming

Southern States

Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia

Southwestern States

*Arizona, *New Mexico, Oklahoma, Texas

*Arizona and New Mexico also are often grouped with the Rocky Mountain States.

FACTS IN BRIEF ABOUT

State	Capital	Popular Name	Area (sq. mi.)	Area (km²)	Rank in Area	Population*	Rank in Pop.*	Population Density* (sq. mi.)	Population Density* (km²)
Alabama	Montgomery	Yellowhammer State	51,609	133,667	29	3,444,165	21	67	26
Alaska	Juneau	Last Frontier	586,412	1,518,800	1	302,173	50	0.5	0.2
Arizona	Phoenix	Grand Canyon State	113,909	295,023	6	1,772,482	33	16	6
Arkansas	Little Rock	Land of Opportunity	53,104	137,539	27	1,923,295	32	36	14
California	Sacramento	Golden State	158,693	411,013	3	19,953,134	1	126	49
Colorado	Denver	Centennial State	104,247	269,998	8	2,207,259	30	21	8
Connecticut	Hartford	Constitution State	5,009	12,973	48	3,032,217	24	605	234
Delaware	Dover	First State	2,057	5,328	49	548,104	46	266	103
Florida	Tallahassee	Sunshine State	58,560	151,670	22	6,789,443	9	116	45
Georgia	Atlanta	Empire State of the South	58,876	152,488	21	4,589,575	15	78	30
Hawaii	Honolulu	Aloha State	6,450	16,705	47	769,913	40	119	46
Idaho	Boise	Gem State	83,557	216,412	13	713,008	42	9	3
Illinois	Springfield	Land of Lincoln	56,400	146,075	24	11,113,976	5	197	76
Indiana	Indianapolis	Hoosier State	36,291	93,993	38	5,193,669	11	143	55
Iowa	Des Moines	Hawkeye State	56,290	145,790	25	2,825,041	25	50	19
Kansas	Topeka	Sunflower State	82,264	213,063	14	2,249,071	28	27	10
Kentucky	Frankfort	Bluegrass State	40,395	104,623	37	3,219,311	23	80	31
Louisiana	Baton Rouge	Pelican State	48,523	125,674	31	3,643,180	20	75	29
Maine	Augusta	Pine Tree State	33,215	86,026	39	993,663	38	30	12
Maryland	Annapolis	Old Line State	10,577	27,394	42	3,922,399	18	371	143

*1970 Census

Geographic Regions of the United States

— MAIN OUTLYING AREAS OF THE UNITED STATES —

Name	Acquired	Status
American Samoa	1900	Organized unincorporated territory
Canal Zone	1903	U.S. jurisdiction; Panama sovereignty
Canton and Enderbury Islands	1939	Joint administration with Great Britain
Guam	1898	Organized unincorporated territory
Howland, Baker, and Jarvis Islands	1857	Unincorporated territory
Johnston Island and Sand Island	1858	Unincorporated territory
Kingman Reef	1922	Unincorporated territory
Midway Islands	1867	Unincorporated territory
Palmyra Island	1898	Unincorporated territory
Puerto Rico	1898	Commonwealth
Trust Territory of the Pacific Islands	1947	UN trust territory (U.S. administration)
Virgin Islands of the United States	1917	Organized unincorporated territory
Wake Island	1898	Unincorporated territory

THE STATES OF THE UNION

State Abbreviation†	State Bird	State Flower	State Tree	State Song	Admitted to the Union	Order of Admission	Members of Congress Senate	Members of Congress House
Ala.	**Yellow-hammer**	**Camellia**	**Southern pine (Longleaf pine)**	**"Alabama"**	**1819**	**22**	**2**	**7**
Alaska	Willow ptarmigan	Forget-me-not	Sitka spruce	"Alaska's Flag"	1959	49	2	1
Ariz.	**Cactus wren**	**Saguaro (Giant cactus)**	**Paloverde**	**"Arizona"**	**1912**	**48**	**2**	**4**
Ark.	Mockingbird	Apple blossom	Pine	"Arkansas"	1836	25	2	4
Calif.	**California valley quail**	**Golden poppy**	**California redwood**	**"I Love You, California"**	**1850**	**31**	**2**	**43**
Colo.	Lark bunting	Rocky Mountain columbine	Blue spruce	"Where the Columbines Grow"	1876	38	2	5
Conn.	**Robin**	**Mountain laurel**	**White oak**	**None**	**1788**	**5**	**2**	**6**
Del.	Blue hen chicken	Peach blossom	American holly	"Our Delaware"	1787	1	2	1
Fla.	**Mockingbird**	**Orange blossom**	**Cabbage (Sabal) palm**	**"Swanee River"**	**1845**	**27**	**2**	**15**
Ga.	Brown thrasher	Cherokee rose	Live oak	"Georgia"	1788	4	2	10
Hawaii	**Nene (Hawaiian Goose)**	**Hibiscus**	**Kukui**	**"Hawaii Ponoi" (Hawaii's Own)**	**1959**	**50**	**2**	**2**
Ida.	Mountain bluebird	Syringa (Mock orange)	Western White pine	"Here We Have Idaho"	1890	43	2	2
Ill.	**Cardinal**	**Native Violet**	**White Oak**	**"Illinois"**	**1818**	**21**	**2**	**24**
Ind.	Cardinal	Peony	Tulip tree, or yellow poplar	"On the Banks of the Wabash"	1816	19	2	11
Ia.	**Eastern goldfinch**	**Wild rose**	**Oak**	**"The Song of Iowa"**	**1846**	**29**	**2**	**6**
Kans. or Kan.	Western meadow lark	Sunflower	Cottonwood	"Home on the Range"	1861	34	2	5
Ky. or Ken.	**Kentucky Cardinal**	**Goldenrod**	**Tulip poplar**	**"My Old Kentucky Home"**	**1792**	**15**	**2**	**7**
La.	Brown pelican	Magnolia	Bald cypress	"Song of Louisiana"	1812	18	2	8
Me.	**Chickadee**	**White pine cone and tassel**	**White pine**	**"State of Maine Song"**	**1820**	**23**	**2**	**2**
Md.	Baltimore oriole	Black-eyed Susan	White oak	"Maryland, My Maryland"	1788	7	2	8

†For the two-letter state abbreviations used by the U.S. Postal Service, see the *table* with the ZIP CODE article.

State	Capital	Popular Name	Area (sq. mi.)	Area (km²)	Rank in Area	Population*	Rank in Pop.*	Population Density* (sq. mi.)	Population Density* (km²)
Massachusetts	Boston	Bay State	8,257	21,385	45	5,689,170	10	689	266
Michigan	Lansing	Wolverine State	58,216	150,779	23	8,875,083	7	152	59
Minnesota	St. Paul	Gopher State	84,068	217,735	12	3,805,069	19	45	17
Mississippi	Jackson	Magnolia State	47,716	123,584	32	2,216,912	29	46	18
Missouri	Jefferson City	Show Me State	69,686	180,486	19	4,677,399	13	67	26
Montana	Helena	Treasure State	147,138	381,086	4	694,409	43	5	2
Nebraska	Lincoln	Cornhusker State	77,227	200,017	15	1,483,791	35	19	7
Nevada	Carson City	Silver State	110,540	286,297	7	488,738	47	4	2
New Hampshire	Concord	Granite State	9,304	24,097	44	737,681	41	79	31
New Jersey	Trenton	Garden State	7,836	20,295	46	7,168,164	8	915	353
New Mexico	Santa Fe	Land of Enchantment	121,666	315,113	5	1,016,000	37	8	3
New York	Albany	Empire State	49,576	128,401	30	18,241,266	2	368	142
North Carolina	Raleigh	Tar Heel State	52,586	136,197	28	5,082,059	12	97	37
North Dakota	Bismarck	Flickertail State	70,665	183,021	17	617,761	45	9	3
Ohio	Columbus	Buckeye State	41,222	106,764	35	10,652,017	6	258	100
Oklahoma	Oklahoma City	Sooner State	69,919	181,089	18	2,559,253	27	37	14
Oregon	Salem	Beaver State	96,981	251,180	10	2,091,385	31	22	8
Pennsylvania	Harrisburg	Keystone State	45,333	117,412	33	11,793,909	3	260	100
Rhode Island	Providence	Little Rhody	1,214	3,144	50	949,723	39	782	302
South Carolina	Columbia	Palmetto State	31,055	80,432	40	2,590,516	26	83	32
South Dakota	Pierre	Sunshine State	77,047	199,551	16	666,257	44	9	3
Tennessee	Nashville	Volunteer State	42,244	109,411	34	3,924,164	17	93	36
Texas	Austin	Lone Star State	267,338	692,402	2	11,196,730	4	42	16
Utah	Salt Lake City	Beehive State	84,916	219,931	11	1,059,273	36	12	5
Vermont	Montpelier	Green Mountain State	9,609	24,887	43	444,732	48	46	18
Virginia	Richmond	Old Dominion	40,817	105,716	36	4,648,494	14	114	44
Washington	Olympia	Evergreen State	68,192	176,616	20	3,409,169	22	50	19
West Virginia	Charleston	Mountain State	24,181	62,628	41	1,744,237	34	72	28
Wisconsin	Madison	Badger State	56,154	145,438	26	4,417,933	16	79	31
Wyoming	Cheyenne	Equality State	97,914	253,596	9	332,416	49	3	1

*1970 Census

THE STATES OF THE UNION

State Abbreviation†	State Bird	State Flower	State Tree	State Song	Admitted to the Union	Order of Admission	Members of Congress Senate	Members of Congress House
Mass.	Chickadee	Arbutus (Mayflower)	American elm	"Hail Massachusetts"**	1788	6	2	12
Mich.	Robin	Apple blossom	White pine	"Michigan, My Michigan"**	1837	26	2	19
Minn.	Common loon	Pink and white lady's-slipper	Norway, or red, pine	"Hail! Minnesota"	1858	32	2	8
Miss.	Mockingbird	Magnolia	Magnolia	"Go, Mis- sis- sip- pi"	1817	20	2	5
Mo.	Bluebird	Hawthorn	Flowering dogwood	"Missouri Waltz"	1821	24	2	10
Mont.	Western meadow lark	Bitterroot	Ponderosa pine	"Montana"	1889	41	2	2
Nebr. or Neb.	Western meadow lark	Goldenrod	Cottonwood	"Beautiful Nebraska"	1867	37	2	3
Nev.	Mountain bluebird**	Sagebrush**	Single-leaf piñon	"Home Means Nevada"	1864	36	2	1
N.H.	Purple finch	Purple lilac	White birch	"Old New Hampshire"	1788	9	2	2
N.J.	Eastern goldfinch	Purple Violet	Red oak	None	1787	3	2	15
N.Mex. or N.M.	Road runner	Yucca	Piñon, or nut pine	"O, Fair New Mexico"	1912	47	2	2
N.Y.	Bluebird	Rose	Sugar maple	None	1788	11	2	39
N.C.	Cardinal	Flowering dogwood	Pine	"The Old North State"	1789	12	2	11
N.Dak. or N.D.	Western meadow lark	Wild prairie rose	American elm	"North Dakota Hymn"	1889	39	2	1
O.	Cardinal	Scarlet carnation	Buckeye	None	1803	17	2	23
Okla.	Scissor-tailed flycatcher	Mistletoe	Redbud	"Oklahoma!"	1907	46	2	6
Ore. or Oreg.	Western meadow lark	Oregon grape	Douglas fir	"Oregon, My Oregon"	1859	33	2	4
Pa. or Penn.	Ruffed grouse	Mountain laurel	Hemlock	None	1787	2	2	25
R.I.	Rhode Island Red	Violet	Red maple	"Rhode Island"	1790	13	2	2
S.C.	Carolina wren	Carolina jessamine	Palmetto	"Carolina"	1788	8	2	6
S.Dak. or S.D.	Ring-necked pheasant	American pasqueflower	Black Hills spruce	"Hail, South Dakota"	1889	40	2	2
Tenn.	Mockingbird	Iris	Tulip poplar	"The Tennessee Waltz"; "When It's Iris Time in Tennessee"; "My Tennessee"	1796	16	2	8
Tex.	Mockingbird	Bluebonnet	Pecan	"Texas, Our Texas"	1845	28	2	24
Ut.	Sea gull	Sego lily	Blue spruce	"Utah, We Love Thee"	1896	45	2	2
Vt.	Hermit thrush	Red clover	Sugar maple	"Hail, Vermont!"	1791	14	2	1
Va.	Cardinal	Flowering dogwood	None	"Carry Me Back to Old Virginia"	1788	10	2	10
Wash.	Willow goldfinch	Coast rhododendron	Western hemlock	"Washington, My Home"	1889	42	2	7
W.Va.	Cardinal	Rhododendron	Sugar maple	"The West Virginia Hills"; "This Is My West Virginia"; "West Virginia, My Home Sweet Home"	1863	35	2	4
Wis.	Robin	Wood Violet	Sugar maple	"On, Wisconsin!"	1848	30	2	9
Wyo.	Meadow lark	Indian paintbrush	Cottonwood	"Wyoming"	1890	44	2	1

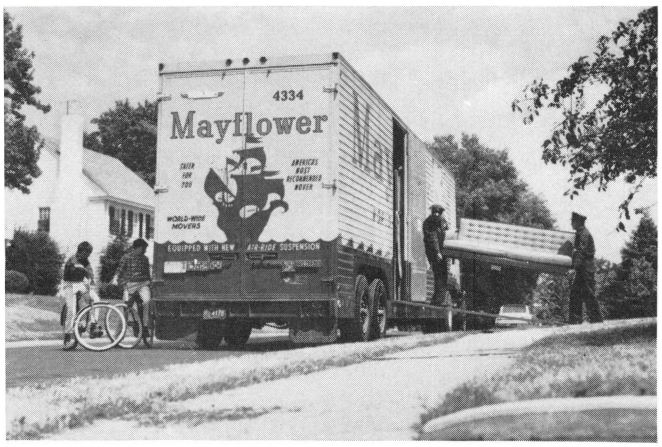
†For the two-letter state abbreviations used by the U.S. Postal Service, see the *table* with the ZIP CODE article.
**Unofficial

Ray Atkeson, Devaney from Publix

Hawaiian Fishermen pull in a net of fish. The American people are made up of many racial and national groups.

Americans on the Move. Every year, millions of Americans move, often to different cities and areas of the country.

Aero Mayflower Transit Co.



UNITED STATES / *People*

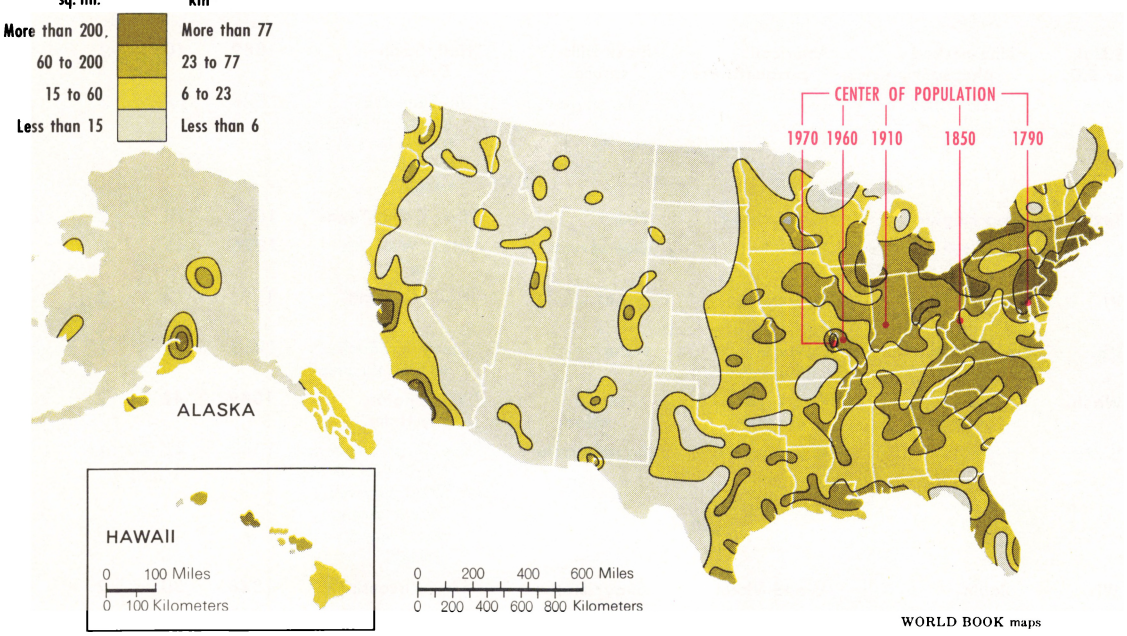
Population and Ancestry. The 1970 United States census reported that the nation had 203,235,298 persons. The country had nearly 180 million whites and more than 22 million blacks. The blacks, who make up the nation's largest minority group, formed about 11 per cent of the population. The nation's 6 million Mexican Americans, who are included among the white population, formed the second largest minority group. The nation also had about 800,000 American Indians.

The U.S. population in 1970 had increased 13 per cent over the 1960 figure, 179,323,175. The nation's population reached an estimated 217,544,000 by 1976. Only three countries are larger. They are, in order of size, China, India, and Russia.

Every American is an immigrant or a descendant of an immigrant. The Indians, Eskimos, and Hawaiians were the first peoples in what is now the United States. But even their ancestors came from other lands thousands of years ago. Most of the settlers in early colonial America came from England. By the time of the Revolutionary War, large numbers of settlers had arrived from other countries. There were Germans in Pennsylvania, Dutch in New York, French in Louisiana, and Spaniards in Florida and California. There also were Negro slaves, brought from Africa to work on Southern plantations. Between 1840 and 1860, about 4,400,000 immigrants came to America. They were drawn by the nation's growing cities and industries, its rich, unsettled land in the West, and its guarantees of individual freedom and opportunities for wealth. Immigrants continued to pour in until the early 1900's. Then, the United States passed laws that limited the number of immigrants. World War II left millions of Europeans

POPULATION

This map shows the *population density* of the United States and how it varies in different parts of the country. Population density means the average number of persons who live in a given area. This map also shows how the center of population has moved westward from 1790 to 1970.



WORLD BOOK maps

homeless, and the United States again opened its doors. Since the war ended in 1945, the nation has received about 8 million more immigrants.

But most Americans now living were born in the United States. Only about 5 of every 100 Americans were born in other countries. About 18 of every 100 are immigrants or children of immigrants. The largest groups born in other countries include, in order of size, Italians, Germans, Poles, Russians, Mexicans, and English and Welsh. See IMMIGRATION AND EMIGRATION.

The United States has long been known as a great *melting pot*. Its people are of all races and have come from many countries. But they have developed a common culture. Most have adopted the nation's customs, followed its traditions, and taken part in its politics. But many Americans also observe customs and holidays of their ancestors. These observances contribute to the variety and richness of American life.

Cities. More than 70 of every 100 Americans live in cities. About 70 of every 100 live in metropolitan areas. The nation's three largest metropolitan areas, according to the 1972 estimate of the U.S. Bureau of the Census, are the New York City area, with 9,943,800 persons; the Chicago area, with 7,084,700 persons; and the Los Angeles-Long Beach area, with 6,999,600 persons.

New York City, with 7,895,563 persons, is the largest city in the United States. It ranks third in the world, after Shanghai and Tokyo. Five other U.S. cities have over a million persons. They are, in order of size, Chicago, Los Angeles, Philadelphia, Detroit, and Houston.

Farms. In 1850, about 85 of every 100 Americans lived on farms or in farm communities. By 1900, about

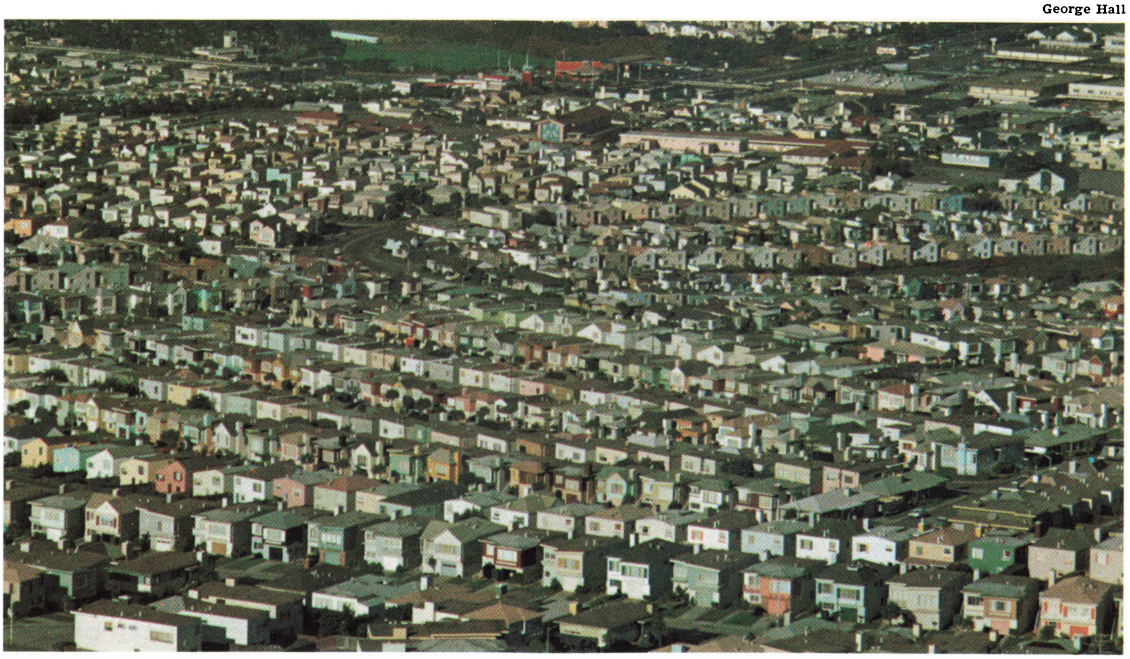
FPG

Football Games attract millions of fans each year. The exciting action makes football a leading spectator sport.

WORLD BOOK photo by W. R. Wilson

Relaxing Under a Shade Tree and swapping stories of the "good old days" is a favorite pastime of America's senior citizens.

George Hall



Rows of Houses, such as these in Daly City outside San Francisco, mark the suburban areas that border many large U.S. cities. More than 70 per cent of the nation's people live in or near cities.

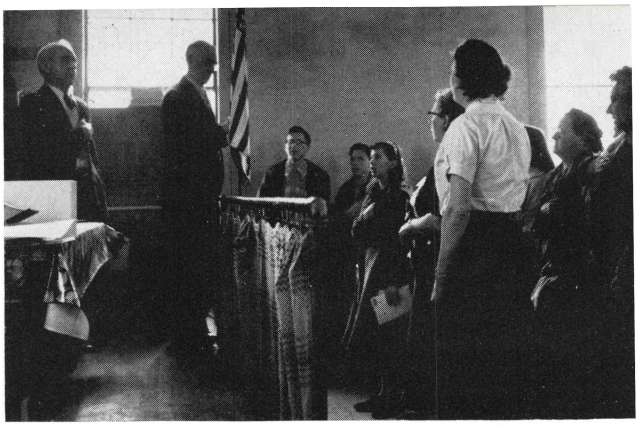
60 of every 100 lived in rural areas. Today, less than 30 per cent of the population is rural—and the percentage continues to fall.

The increasing use of machinery and scientific farming methods has reduced the number of workers needed on farms. Machines and modern methods have also made it possible for farmers to operate larger farms, even with fewer workers. American farms increased in size from an average of 150 acres (61 hectares) in 1900 to about 381 acres (154 hectares) in the 1970's.

The American farmer of today leads a vastly different life from that of his grandfather. Machines have eliminated much backbreaking work. The farmer uses machines to help him plow, plant his seeds, harvest his crops, and deliver his products to market. Some farms have conveyor systems so that the farmer no longer has to shovel feed to his animals. Milking machines make his morning and evening chores easier. In the home, the farmer's wife may have all the comforts and conveniences of a city wife. The automobile, telephone, radio, and television have brought farm families into close contact with the rest of the world. See FARM AND FARMING; RANCHING.

Family Life. The early colonists and pioneers believed strongly in freedom and equality. These ideals were well suited to the new country. There was plenty of room for differences in religion and politics. There was also much work to be done to settle and develop the land. On the frontier, one man's ax was as good as another's, regardless of his beliefs. In various ways, these ideals were written into the laws of the United States.

Families in the United States have an average of 3.44 members. The American ideals of freedom and equality extend into the family. American women are noted for their independence. They participate equally with men in many activities outside the home. About one of every three married women has a job outside the home. Even children share in this equality, and take part in family activities, discussions, and planning.



Grant Heilman

A Town Meeting in Vermont gives all the citizens a chance to take an active, personal part in their local government. Democratic government is the basis of American freedom.

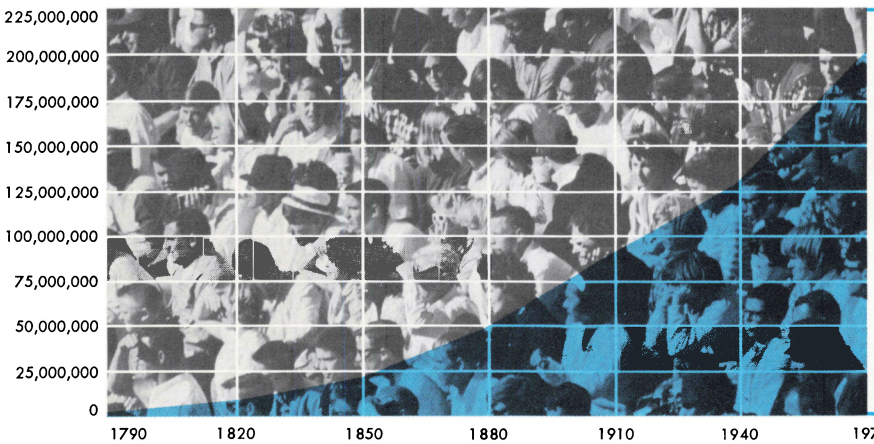
The products of American industry also influence family life. Household appliances make housework easy. Frozen, canned, and concentrated foods make it simple to prepare meals. Such advances help explain how so many American wives find time for so many activities outside the home. Women are active in political parties, community affairs, and charitable and other organizations.

Medical advances through the years have sharply increased the life expectancy of Americans. A baby born in 1900 could be expected to live only to the age of 47. A baby born today can be expected to live to about 70. This increase in life expectancy has also increased the percentage of older people in the population. In 1880, only 3 of every 100 Americans were 65 or older. By the 1970's, the number had increased to about 10 of every 100.

Americans are a people on the move. Every year, about one of every five Americans changes his place of residence. He may simply move from a small house to a larger one. He may be transferred to another town by the company for which he works. Or, like the pioneers before him, he may seek a new life and new opportunities in a different section of the United States.

THE POPULATION OF THE UNITED STATES—1790 to 1970

America's population has risen steadily since the first census. The greatest percentage growth took place in the early years, with increases of more than a third in a 10-year period. The largest total increase took place between 1950 and 1960, when almost 29,000,000 persons were added to the population.



Census Year	Population
1790	3,929,214
1800	5,308,483
1810	7,239,881
1820	9,638,453
1830	12,866,020
1840	17,069,453
1850	23,191,876
1860	31,443,321
1870	38,558,371
1880	50,155,783
1890	62,947,714
1900	75,994,575
1910	91,972,266
1920	105,710,620
1930	122,775,046
1940	131,669,275
1950	150,697,361
1960	179,323,175
1970	203,235,298

De Wys, Inc.

Camping appeals to millions of American families who enjoy the outdoors. Many families with portable tents spend their vacations camping out in national parks and wilderness areas.

Religion. The United States has no laws requiring any person to belong to any religious group. Complete freedom of worship is guaranteed by Amendment 1 to the United States Constitution. Almost two-thirds of the population belong to an organized religious group. About 95 of every 100 members of religious groups are Christians, and almost 5 are Jews. A relatively small number of Americans belong to the Islamic faith or to various Eastern religions, such as Buddhism. About two-thirds of the Christians are Protestants. The largest Protestant groups are the Baptists, Lutherans, and Methodists. The Roman Catholic Church has more members than any single Protestant group. For the memberships of the major religious bodies in the United States, see RELIGION (table).

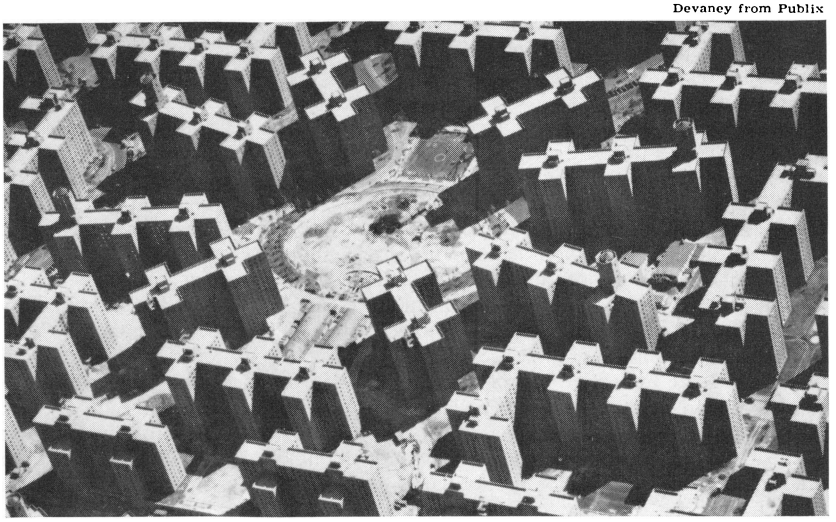
Recreation. The productivity of America's economic system has earned the people more and more leisure time. In 1900, factory workers spent an average of about 60 hours a week on their jobs, and earned about $13. Today, they spend about 41 hours a week at work, and earn about $166. To help Americans enjoy their spare time, cities and towns have playgrounds, parks, and swimming pools. The federal and state governments operate large parks and other recreation areas.

Americans spend much of their free time at home. Television has brought motion pictures, plays, and major league baseball into the living room. The high-fidelity stereophonic phonograph has made the home a concert hall. Americans spend many leisure hours reading books and magazines. Entertaining friends at home is another important part of the American way of life. One result of the increase in leisure time is the *do-it-yourselfer*. The head of the household or other members of the family use part of their spare time to make their own household repairs and to do their own redecorating and remodeling.

Millions of Americans are active in bowling, baseball, golf, tennis, and other sports. Many more enjoy attending sports contests in which professional and amateur teams compete. Every year, millions of Americans enroll in various kinds of study courses to broaden their education and experience. Others take up such hobbies as music, photography, stamp collecting, or painting. Many Americans spend much of their leisure time taking part in local government activities or in working with community-service groups.

American families eagerly look forward to their annual vacation. During the 1920's, employers began to accept the idea of giving office employees a paid vacation every year. Today, almost all workers—office and factory—receive a two-week vacation annually. Some employees receive three weeks or more. Every summer, millions of Americans pack their suitcases and head for their favorite recreation areas. Many travel in comfortable automobiles or motor homes to state and national parks, to summer resorts, or to large cities. A growing number of Americans also use their cars to tow camping or travel trailers to their vacation destinations. Many families camp out for several days or weeks. Air travel makes it easy for many Americans to vacation nearly anywhere in the United States and in many other countries. See CAMPING; HOBBY; RECREATION; TRAILER.

Devaney from Publix



High-Rise Apartments, such as these in Stuyvesant Town in New York City, are the homes of large numbers of city dwellers. Most tall apartment buildings stand near the downtown areas of large cities. Many are part of vast urban renewal projects to rebuild America's cities.

Ben Ross, Photo Trends

American Schools provide students with instruction in basic skills. Children are also encouraged to develop their own natural interests and abilities. Modern classrooms, such as this one, permit small groups of children to work on special projects.

UNITED STATES/*Education*

Schools. Americans believe that every person should have the opportunity to receive the best possible education to develop his talents and abilities. The ideal of free public schooling for every child began to win increasing support during the early 1800's. More and more educators and statesmen pointed out that America's prosperity and strength depended on widespread systems of public schools. Between 1830 and 1850, such noted educators as Horace Mann and Henry Barnard worked for public control and support of elementary and high schools. In 1852, Massachusetts passed the first law requiring children to attend school.

After the Civil War ended in 1865, many states established public elementary and high schools. There was also a remarkable growth in state universities and agricultural and technical colleges. By the early 1900's, the ideal of a high school education for everyone was broadly accepted in the United States. The number of students who completed high school and qualified for college increased enormously. A tremendous growth in college and university enrollments followed.

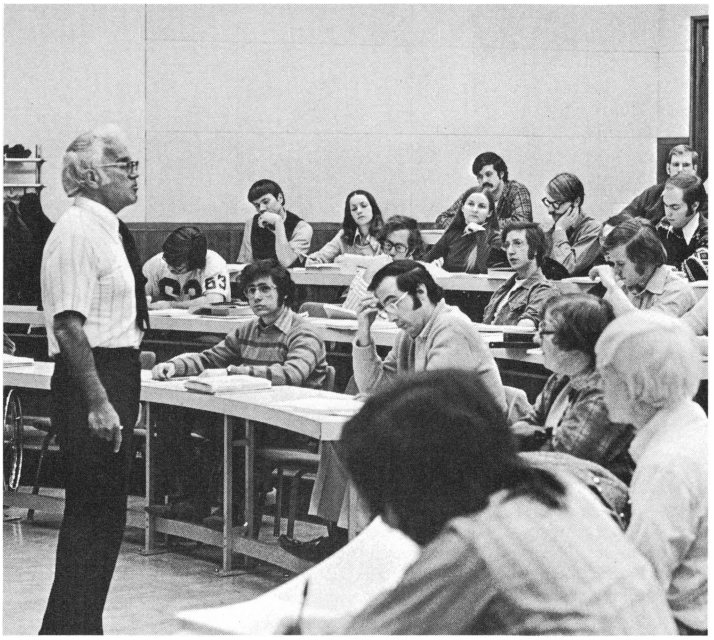
Today, about 59 million Americans attend some kind of school, college, or university. Millions of other Americans are enrolled in adult education courses. About 97 out of 100 children in the United States receive at least an eighth-grade education. About 75 out of 100 graduate from high school. Over 20 out of 100 receive a degree from a four-year college or university. A broad program of education has made Americans one of the most schooled people in the world. Only about 1 out of 100 Americans cannot read or write.

Each state is responsible for its own system of public education. Almost all the states require children to attend school. In most states, they must do so until the age of 16. The states give many educational responsibilities to local boards of education. Most of these boards are elected by the voters in local school districts. Most public schools in the United States are financed and controlled locally. But the federal and state governments are playing an increasing role in financing local school systems.

The states also authorize and accredit private and *parochial* (church supported) schools that meet certain academic standards. At the elementary level, about 10 out of 100 students attend a private or parochial school. At the high school level, about 8 out of 100 go to a private or parochial school. About 25 out of 100 college students attend private or parochial schools. See EDUCATION.

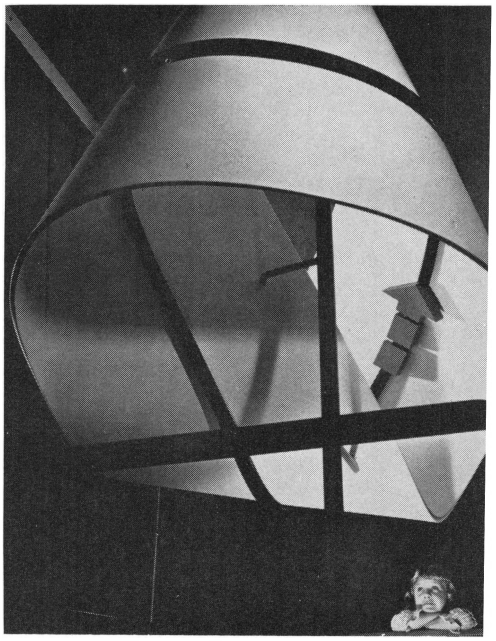
Libraries. Public libraries began in the United States. The movement for free public libraries in America began about the same time as the movement for free public schools. By the mid-1800's, an increasing number of cities and towns were supporting libraries as an accepted function of local government. Today, the United States has about 7,000 public libraries, of which about 4,880 are branches of a city, county, or regional library system. There are also about 2,700 junior college, college, and university libraries. Thousands of elementary schools and high schools have libraries.

The Library of Congress is the largest library in the United States. This library, founded in 1800, has over 15 million books and pamphlets. More than 70 university libraries in the United States have over 1 million



Ken Hildreth, Illini Publishing Co.

A College Education helps young Americans enjoy richer, more meaningful lives. Of every 10 children in the United States, 2 will graduate from college.



California Museum of Science and Industry

Science Museums feature such exhibits as the Möbius Band, *above*, a geometric figure.

volumes each. The largest is that of Harvard University, with about 9 million volumes.

There are several thousand special libraries in the United States. These libraries limit their collections to certain fields. Outstanding ones include the John Crerar Library of scientific and technical information in Chicago, and the National Library of Medicine in Bethesda, Md. American libraries have pioneered in many fields of service. Many provide audio-visual aids, music rooms, and art rooms. See LIBRARY.

Museums. There are about 5,600 museums in the United States. They include general museums, and special museums of art, history, natural history, and applied science. The first museum in the country, the Charleston Museum, was established by the Charleston (S.C.) Library Society in 1773. It still has a fine collection dealing with the history of South Carolina. The nation's oldest art museum is the Pennsylvania Academy of the Fine Arts in Philadelphia, founded in 1805.

Other famous museums include the American Museum of Natural History in New York City; the Art Institute of Chicago; the Field Museum of Natural History in Chicago; the Guggenheim Museum in New York City; the Metropolitan Museum of Art in New York City; the Museum of Modern Art in New York City; the Museum of Science and Industry in Chicago; the National Gallery of Art in Washington, D.C.; the Peabody Museum of Natural History at Yale University in New Haven, Conn.; the Smithsonian Institution in Washington, D.C.; and the William Rockhill Nelson Gallery of Art and Mary Atkins Museum of Fine Arts in Kansas City, Mo. See MUSEUM.

Scientific Research. America's emphasis on the importance of education for everyone has encouraged the growth of scientific research. More Nobel prize-winning scientists have come from the United States than from any other country. Americans have received more than 110 Nobel prizes, more than three-fourths of them in the field of science. The great discoveries and achievements credited to Americans by the Nobel awards include the measurement of the speed of light, the effect of X rays on atoms, the function of chromosomes in heredity, and the production of the world's first maser. See NOBEL PRIZES.

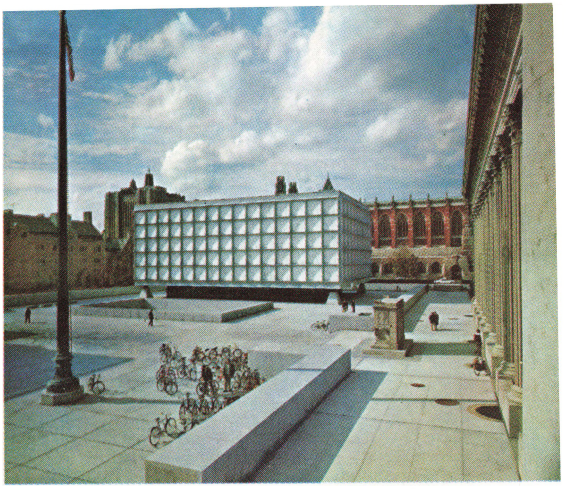
In 1957, the space age began when Russia launched the first man-made earth satellite. Competition among countries in the exploration of outer space suddenly became intense, especially between the United States and Russia. The opening of the Space Age also marked the beginning of intensified scientific research. In 1957, the U.S. government spent about $4,462,000,000 for research and development in the sciences. In the early 1970's, it was spending more than $15 billion a year. American industry has also increased its research programs to produce new and better products and processes.

The tremendous expansion of scientific activity created a new challenge for U.S. colleges and universities, which train scientists and engineers. In addition, college laboratories conduct much of the research financed by government and industry. The emphasis on science has been reflected in the high schools and in some elementary schools, which have broadened their science courses.

THE ARTS IN THE UNITED STATES

Art and Architecture

The individual freedom that marks the American way of life has helped the arts flourish in the United States. The early settlers brought European arts to America, and many of these arts soon took on American features. In architecture, for example, such styles as New England, Dutch Colonial, and Southern Colonial were alterations of European styles, and were created to fit American materials and needs. American sculptors and painters followed European trends for a longer time. Today, the United States is a major influence in world art and architecture. Most American artists have a keen interest in developing new styles, new ways of expressing themselves, and even new forms of art.



Beinecke Rare Book and Manuscript Library at Yale University

American Painting Before 1913 tended to be realistic. *Mrs. Elizabeth Freake* and *Poestenkill*, with their lack of shading and great detail, are fine examples of early primitive art. Many painters of the 1800's, such as James Whistler, were influenced by European styles. Others, including Thomas Eakins, developed individual styles. In the early 1900's, artists began painting everyday life. Charles Marion Russell, for example, painted the West. John Sloan portrayed city life.

Architecture took on distinctly American features early in the country's history. Louis Sullivan helped create the skyscraper in the late 1800's. The imagination of Frank Lloyd Wright influenced architects throughout the world. Today, most American architects use steel, glass, and concrete to create buildings that are striking in their boldness and simplicity.

Mrs. Elizabeth Freake and Baby Mary (artist unknown)

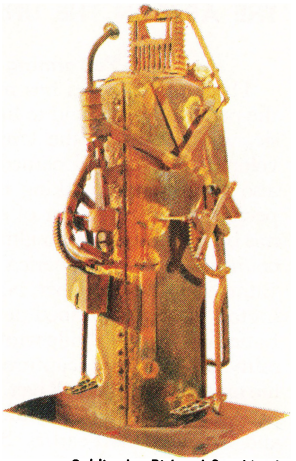
Poestenkill, New York by Joseph H. Hidley

Bronc to Breakfast by Charles Marion Russell

South Beach Bathers by John Sloan

Deacon Samuel Chapin by Augustus Saint-Gaudens

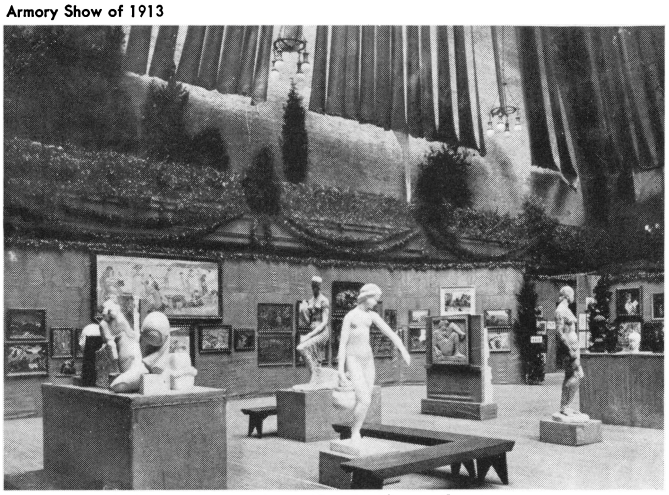
Franklin D. Roosevelt by Jo Davidson



Soldier by Richard Stankiewicz

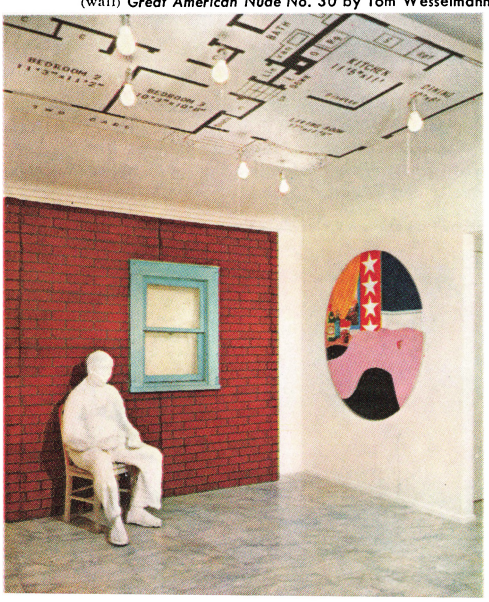
American Sculpture largely imitated European styles and tastes until the 1900's. Augustus Saint-Gaudens was one of the few American sculptors of the 1800's who showed true imagination in his powerful public monuments. Today, American sculpture is chiefly a personal expression. It takes many forms, and uses a wide variety of materials. For example, Jo Davidson is noted for his lifelike bronze portraits of famous persons. Richard Stankiewicz welds sculptures out of metal to create startling abstract works.

Armory Show of 1913



Premiere by Stuart Davis

Below: Sculpture—*Henry's Piece* by George Segal; Paintings—(ceiling) *Doorstop* by James Rosenquist, (wall) *Great American Nude No. 30* by Tom Wesselmann



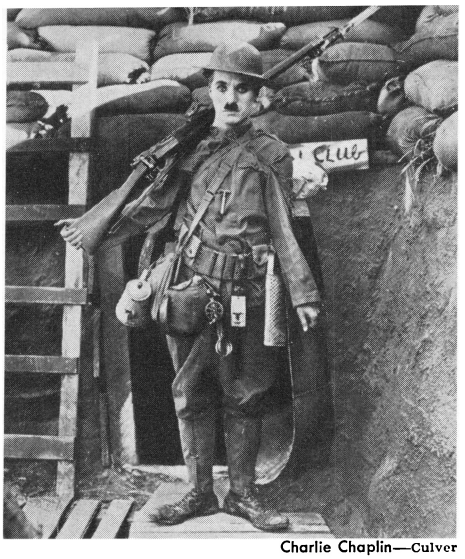
Painting Since 1913. In 1913, an exhibition of modern art was held in an armory in New York City. The Armory Show revolutionized American art. A group of realist painters organized the show to protest against the conservative art galleries that refused to exhibit their pictures. The show also exhibited European art works. These abstract works attracted the most attention. The public found modern European art laughable or shocking. But American artists found it inspiring, and many of them adopted modern European styles. Some American artists of the 1930's, such as Grant Wood, were *regionalists*—painters who portrayed their own states. In the 1940's, some artists, such as Edward Hopper, turned out strikingly realistic American paintings. But by the 1950's, abstract art was firmly established. Today, American painters continually try new styles. In the 1950's, for example, *pop* (popular) art, which looks like posters, or is based on such things as comic strips, first appeared. During the 1960's, *op* art—paintings that are optical illusions—attracted attention.

CREDITS (left to right): *Top Row*—Courtesy Skidmore, Owings & Merrill, and Yale University, photo by Ezra Stoller; Parks Department, City of Springfield, Mass.; Franklin D. Roosevelt Library; William Heller, Inc., New York. *Middle Row*—Worcester Art Museum, gift of Mr. and Mrs. Albert W. Rice; The Metropolitan Museum of Art, New York, gift of Edgar William and Bernice Chrysler Garbisch, 1963; Courtesy The Museum of Modern Art, New York; Los Angeles County Museum of Art. *Bottom Row*—Montana Historical Society; Collection Walker Art Center, Minneapolis; Courtesy of Mr. and Mrs. Robert C. Scull, New York, WORLD BOOK photo by Robert Crandall.

THE ARTS IN THE UNITED STATES

The Performing Arts and Literature

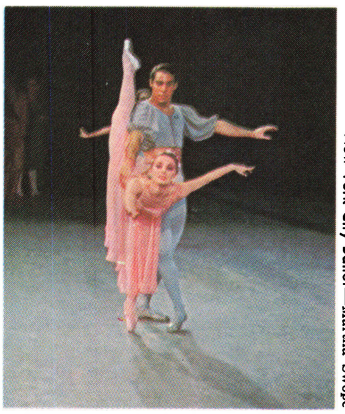
The United States has made important contributions to the performing arts and to literature. Jazz, a new form of music, was created in the United States, and Americans developed the musical comedy into a major art. Americans also pioneered in making motion pictures an art form, especially during the era of silent films. American literature has been translated into almost every language. Early in the country's history, America produced outstanding writers. James Fenimore Cooper, Nathaniel Hawthorne, and Washington Irving described a young and growing America. Later, Herman Melville wrote of the sea and problems of morality. Mark Twain captured the flavor and salty humor of life on the Mississippi River. Six Americans have won Nobel prizes for literature. They are the playwright Eugene O'Neill and the novelists Pearl S. Buck, William Faulkner, Ernest Hemingway, Sinclair Lewis, and John Steinbeck.



Charlie Chaplin—Culver

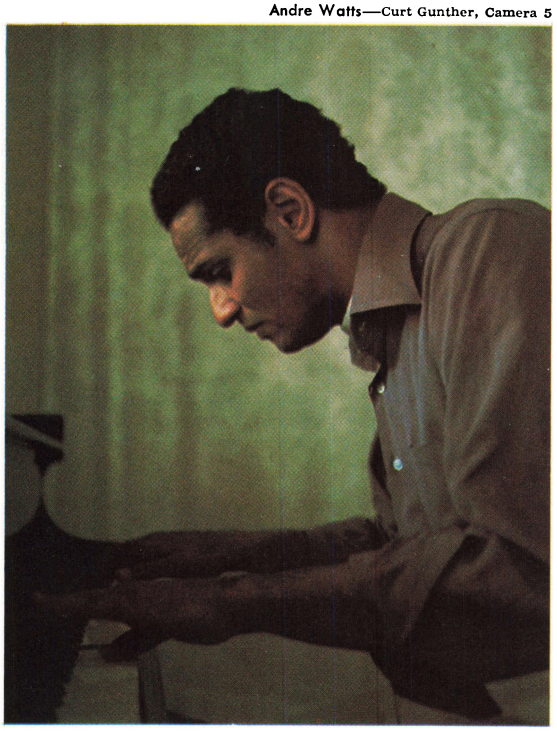
Motion Pictures are an American contribution to the arts. The first commercial showing of motion pictures in the United States took place in 1896. Since then, the movies have become a major art form, and provide entertainment for millions of persons throughout the world. Movie actors have become international celebrities since the days of silent motion pictures. One of the first and greatest movie stars was Charlie Chaplin.

Ted Shawn and Ruth St. Denis—John Lindquist

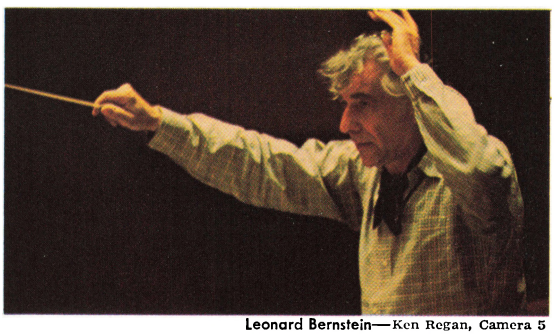


New York City Ballet—Martha Swope

The Dance in the United States reflects Americans' constant desire for change, and their love for new and different things. Such noted dancers as Ted Shawn and Ruth St. Denis helped create the modern dance by bringing new life and new forms to the traditional dance. Americans also brought a fresh approach to classical ballet by stressing natural steps and moves.



Andre Watts—Curt Gunther, Camera 5



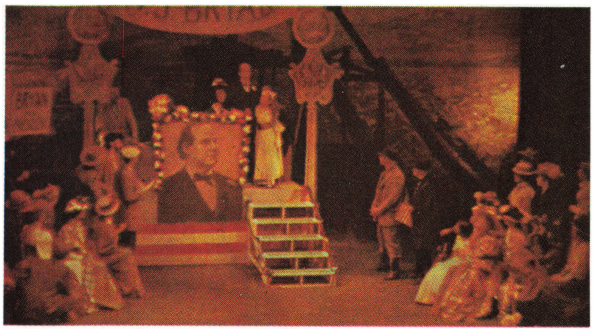
Leonard Bernstein—Ken Regan, Camera 5

Concert Music. In the early 1900's, American composers began to develop an American musical style. They soon won world acclaim. Conductor-composer Leonard Bernstein and pianist Andre Watts rank among the leading figures of today in concert music in the United States.

Symphony Hall at Los Angeles Music Center—Welton Becket and Assoc.

Alley Theatre, Houston—WORLD BOOK photo, Bert Brandt

Theater in America means New York City's Broadway to many persons. But professional companies, such as Houston's Alley Theatre, and amateur groups exist throughout the country. Leonard Bernstein's *West Side Story*, with its lively dances and haunting songs, symbolizes America's unique contribution to world theater—the musical comedy.

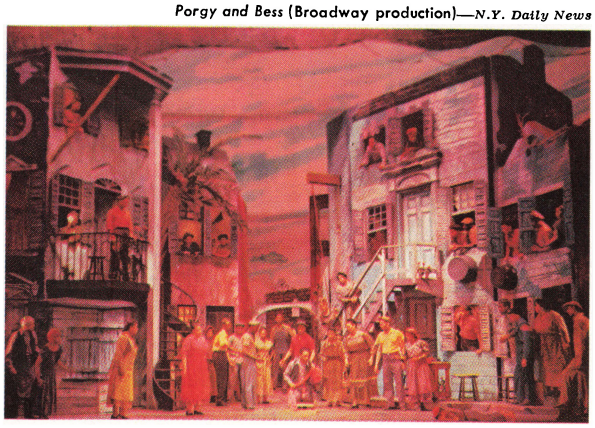


The Ballad of Baby Doe staged by the Central City Opera—Fred M. Mazzulla

American Opera is based largely on the country's literature, legends, and history. Douglas Moore's *Ballad of Baby Doe*, for example, tells of the rise and fall of a Colorado silver king. The first triumphant American opera was George Gershwin's great folk opera *Porgy and Bess*. It opened in New York City in 1935.

West Side Story (Broadway production)—*N.Y. Daily News*

Porgy and Bess (Broadway production)—*N.Y. Daily News*



Pete Seeger—Columbia Records

American Folk Music and Jazz—two thoroughly American forms of music—are immensely popular. Noted performers in these fields include folk singer Pete Seeger and jazz musician Dizzy Gillespie.

Dizzy Gillespie—Bert Goldblatt

Die Meistersinger staged by the Metropolitan Opera—Louis Melancon

Grand Opera in the United States is still developing, and has not yet become widely popular. New York City's Metropolitan Opera is the nation's leading opera company. It is noted for its spectacular productions of standard works. Chicago, San Francisco, and several other American cities also have outstanding opera companies.

Specially created for **World Book Encyclopedia** by Rand McNally and World Book editors

UNITED STATES
Barren Areas Above Timber
Evergreen Trees
Deciduous Trees
Shrub
Medium Grass
Short Grass
Tundra
Barren Arid Areas
Below Sea Level No Vegetation Shown
National Capitals
State Capitals
Cities and Towns
State Boundaries
Rail Lines
0 25 50 100 150 200 Miles
0 50 100 150 200 250 Kilometers
Lake Winnipeg
L. Seul
Winnipeg
Lake of the Woods
Rainy L.
Red L.
Leech L.
Fargo
Duluth
Marquette
Sault Ste. Marie
Lake Superior
Ottawa
L. Nippissing
Montreal
Campbellton
St. Lawrence R.
Augusta
Portland
Boston
Providence
Concord
Montpelier
Minneapolis
St. Paul
Sioux Falls
Green Bay
Traverse City
Lake Michigan
Lake Huron
Georgian Bay
Toronto
L. Ontario
Syracuse
Albany
Buffalo
Hartford
New York
Trenton
Philadelphia
Harrisburg
Pittsburgh
Cleveland
Detroit
Lake Erie
Lansing
Toledo
Chicago
South Bend
Milwaukee
Madison
Davenport
Des Moines
Omaha
Lincoln
Peoria
Springfield
Indianapolis
Columbus
Cincinnati
Baltimore
Annapolis
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Chesapeake Bay
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St. Louis
Jefferson City
Evansville
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UNITED STATES / *Land Regions*

The United States has an area of 3,615,122 square miles (9,363,123 square kilometers). This area includes 3,536,855 square miles (9,160,412 square kilometers) of land and 78,267 square miles (202,711 square kilometers) of inland water. But it excludes 60,788 square miles (157,440 square kilometers) of the Great Lakes and Lake St. Clair and 13,942 square miles (36,110 square kilometers) of coastal water. Only Russia, Canada, and China are larger in area.

The U.S. mainland, excluding Alaska, can be divided into seven major land regions. They are: (1) the Appalachian Highlands, (2) the Coastal Lowlands, (3) the Interior Plains, (4) the Ozark-Ouachita Highlands, (5) the Rocky Mountains, (6) the Western Plateaus, Basins, and Ranges, and (7) the Pacific Ranges and Lowlands. For a discussion of the land regions of Alaska and Hawaii, see the articles on these states.

The Appalachian Highlands extend from the northeastern corner of the country southwest into Georgia and Alabama. The region's three main subdivisions lie side by side in three long belts. They are, from east to west: (1) the Blue Ridge Mountains Area, (2) the Ridge and Valley Region, and (3) the Appalachian Plateau.

The Blue Ridge Mountains Area runs from Pennsylvania south through the Great Smoky and Unaka ranges in the Carolinas, Tennessee, and Georgia. The Green Mountains of Vermont and the White Mountains of New Hampshire form northeastern extensions of the Blue Ridge. The cool summer climate, sparkling streams, and natural beauty of the Blue Ridge Mountains make them a favorite recreation area. Rivers cut through the mountains in steep, forested valleys. These picturesque *water gaps* provide low, level routes for highways and railroads. See BLUE RIDGE MOUNTAINS.

The Ridge and Valley Region. West of the Blue Ridge Mountains, a great series of valleys extends from New York to Tennessee. From north to south, these valleys include the Hudson Valley in New York, the Cumberland Valley in Pennsylvania, the Shenandoah Valley in Virginia, and the Valley of East Tennessee in Tennessee. All these valleys together are known by the general name of the *Great Valley*. The valley bottoms are generally level, except where rivers have cut narrow channels, or where low, rocky hills rise above the valley floors. Prosperous farms and thriving cities, such as Albany and Knoxville, lie in the valleys.

The Appalachian Plateau rises west of the Ridge and Valley Region. This plateau has various local names. It is called the Allegheny Plateau in Pennsylvania, the Kanawha Plateau in West Virginia, and the Cumberland Plateau in eastern Kentucky, eastern Tennessee, and northern Alabama. Rivers have cut deeply into the plateau. In places, the hillsides are so steep that the plateau looks much like a mountain area. A few valleys and some flat areas make good farmland. Rich beds of coal and deposits of petroleum are found beneath parts of the plateau. Some of the nation's greatest industrial centers, such as Pittsburgh, are within the region.

In some parts of Kentucky and West Virginia, the Appalachian Plateau is covered with thin, sandy soil. The sharp, steep hillsides are badly eroded. Only a few farmers attempt to make a living from this poor land. These areas have few good roads, and the hills have almost shut the people off from the rest of the country. The people of the hills have clung to old customs and manners of speech. Their folk songs date back to the early days of the nation. See APPALACHIAN MOUNTAINS.

The Coastal Lowlands have three subdivisions: (1) the Atlantic Coastal Plain, (2) the Piedmont, and (3) the Gulf Coastal Plain.

The Atlantic Coastal Plain extends from New England to the southern tip of Florida. Narrow in the north, it widens to about 500 miles (800 kilometers) in the south. The earliest colonists in America settled along the Atlantic Coast. Ways of making a living differed from place to place. In Virginia, farming was important from

Coastal Islands off South Carolina near Charleston are part of the Coastal Lowlands. This region extends along the coast from New England around southern Florida to Mexico.
Louis Schwartz

*Excluding Alaska and Hawaii.

WORLD BOOK map

the beginning. There, the colonists established the first great Southern plantations. But in New England, which has no broad coastal plain for farming, the colonists turned to the sea—to fishing and shipping.

Along the inland edge of the Atlantic Coastal Plain is the fall line. Rivers from the Appalachian Highlands reach the fall line and tumble down to the lower coastal plain in a series of falls or rapids. In the early days, boats sailed up the coastal rivers from the Atlantic Ocean until they reached the fall line. The boats could go no farther inland, and their cargoes were unloaded. In addition, the rapids furnished water power for manufacturing. Industrial cities, such as Raleigh and Richmond, grew up along the fall line.

The rivers that drain the Atlantic Coastal Plain are fairly short, from 100 to 300 miles (160 to 480 kilometers) long. They include the Delaware, Hudson, Potomac, and Susquehanna. Most of the rivers flow into the Atlantic Ocean.

Many of the bays along the Atlantic Coast make excellent harbors. These bays include Boston Bay, Cape Cod Bay, Chesapeake Bay, Delaware Bay, Long Island Sound, and New York Bay. Great cities have grown up beside these bays, including Baltimore, Boston, New York City, Norfolk, and Philadelphia.

The Piedmont is an irregular plain that lies just inland from the *fall line*. This line is where the hard rock of the Piedmont meets the softer rock of the Gulf and Atlantic coastal plains. The Piedmont extends from New England to central Alabama. Rains have washed away most of the topsoil throughout much of the region. Piedmont farmers grow tobacco and apples, and keep dairy cattle. See FALL LINE; PIEDMONT REGION.

The Gulf Coastal Plain borders the Gulf of Mexico from the southern tip of Florida to Mexico. The land is flat, and the climate ranges from warm to hot. Farmers raise rice and subtropical fruits near the gulf. Farther north lies the Cotton Belt of the United States.

Grossman, Alpha

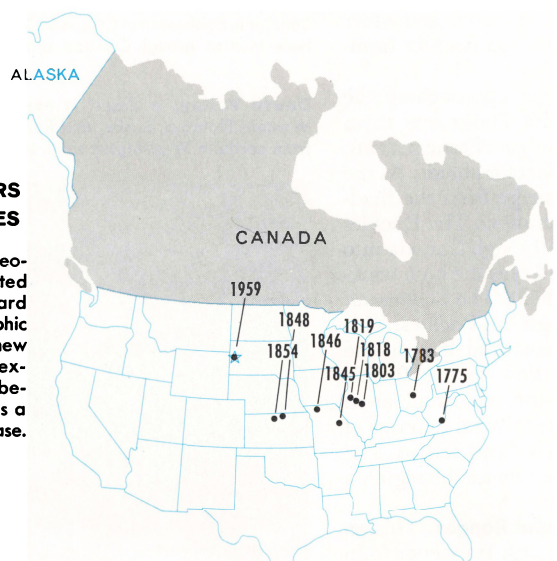
A Fertile Valley in North Carolina lies in the Appalachian Highlands region, which extends from Maine southwest into Alabama.

The two most important rivers of the Gulf Coastal Plain are the Mississippi and the Rio Grande. The Mississippi and its chief branch, the Missouri, form one of the world's largest river systems. The system drains most of the Interior Plains as well as part of the Gulf Coastal Plain. The Rio Grande rises in the southern Rocky Mountains and flows across the Southwest United States to the Gulf of Mexico.

Engineers have dredged out the sand and deepened the bays along the Gulf Coast to form harbors for ocean-going ships. These include the harbors at Charleston, Corpus Christi, Galveston, Mobile, and Tampa. Important coastal river ports include Beaumont, Houston, Jacksonville, New Orleans, and Savannah.

GEOGRAPHIC CENTERS OF THE UNITED STATES

This map shows how the geographic center of the United States has moved westward since 1775. The geographic center moves each time new territory is added. As an example, the wide change between 1783 and 1803 was a result of the Louisiana Purchase.



WORLD BOOK map

Fields of Wheat grow in western Kansas on the Interior Plains. This vast heartland of America stretches from the Appalachian Highlands west to the Rockies.

Photography House

The Interior Plains sweep westward from the Appalachian Highlands to the Rocky Mountains. The western part of the Interior Plains is known as the *Great Plains*. Some of the world's most productive farms and many of its greatest manufacturing centers are on the Interior Plains. Several hilly sections rise above the plains, including the Black Hills of South Dakota. Many features of the Interior Plains were created by glaciers which covered parts of the region during the Ice Age. The glaciers left sections of Illinois and Iowa extremely flat, making them ideal for farming. The glaciers also left sections of northern Minnesota, Wisconsin, and Michigan sandy, rough, or swampy.

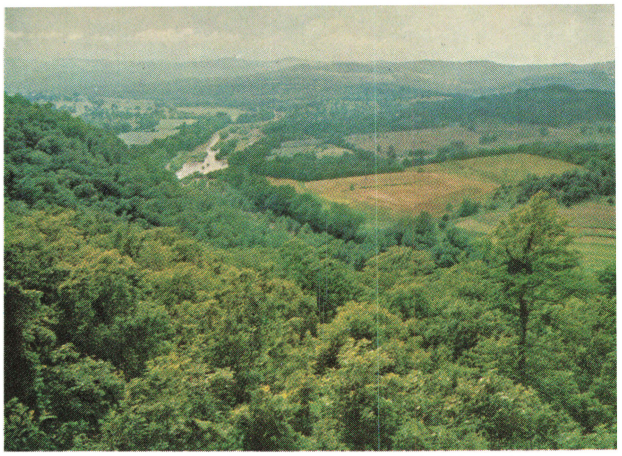
The mighty Mississippi River cuts through the middle of the Interior Plains. Since the days of earliest settlement, the Mississippi and its branches have provided a water highway through this vast interior region of America. Two branches, the Ohio and Missouri rivers, also rank among the world's most important rivers.

The five Great Lakes have been as important as the rivers in the development of the Interior Plains. These lakes—Erie, Huron, Michigan, Ontario, and Superior—are the world's largest group of fresh-water lakes. The lakes cover a total area of 94,510 square miles (244,780 square kilometers). The U.S. portion has an area of 60,590 square miles (156,927 square kilometers), slightly less than the combined area of the six New England states. Some lake boats that sail the Great Lakes are larger than ocean ships. The St. Lawrence Seaway links the Great Lakes with world shipping routes. Such cities as Buffalo, Chicago, Cleveland, Detroit, Duluth, and Milwaukee owe much of their commercial and industrial importance to the Great Lakes.

The Ozark-Ouachita Highlands rise above the Interior Plains. The highlands cover extreme southern Illinois, most of southern Missouri, northwestern Arkansas, and eastern Oklahoma. This region is famous for its rugged beauty, and is a favorite vacationland. There are many swift, clear rivers; big springs; and underground caves. The hills are covered with thick forests and contain rich deposits of coal, iron, and other minerals. Much of the region's soil is too poor for farming, except in the river valleys.

The Rocky Mountains. A traveler approaching the Rocky Mountains from the Interior Plains sees them first as great blue shadows on the horizon. Some persons, in fact, mistake the mountains at first for clouds. As the traveler gets closer, great peaks emerge from the shadows. Some of them are capped with snow. The Rockies extend from northern New Mexico through Canada into Alaska. This great mountain chain forms the high backbone of the North American continent. The *Continental Divide*, or *Great Divide*, passes through the Rockies. This is a line which separates the streams that flow to the Atlantic Ocean from those that flow to the Pacific Ocean. Towns and cities lie on the few small areas of level valley land and around the mineral deposits of the Rockies. But most of the region is thinly settled. The grandeur and wildlife of the Rockies make the region a popular vacationland.

The Western Plateaus, Basins, and Ranges. This region lies west of the Rocky Mountains. It extends from



Fred Bond, Publix

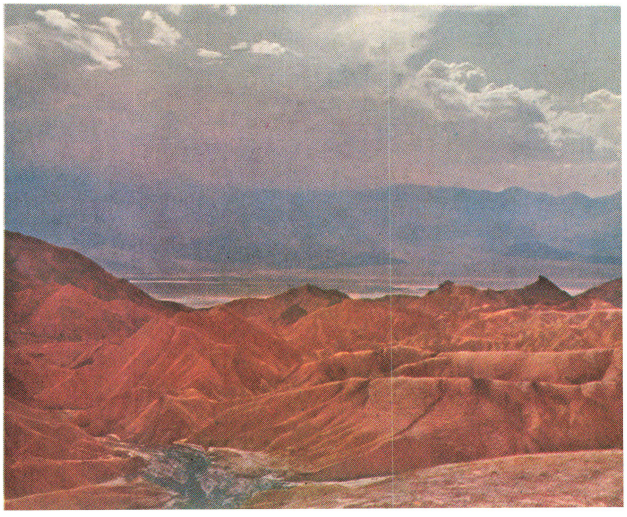
Forested Hills and Fertile River Valleys cover the Ozark-Ouachita Highlands. The highlands rise above the Interior Plains, and cover parts of Illinois, Missouri, Arkansas, and Oklahoma.

James H. Roberts, Alpha

The Rugged Rocky Mountains tower high above the city of Boulder in north-central Colorado. The Rockies extend from northern New Mexico through Canada into Alaska.

Death Valley, a desert in east-central California, lies in the Western Plateaus, Basins, and Ranges region. This region extends from northern Washington south to the Mexican border.

Alpha Photo Assoc.



northern Washington south to the Mexican border. The *Columbia Plateau* occupies the northern part of the region. It covers southeastern Washington, eastern Oregon, and southwestern Idaho. The plateau was built up from lava flows that came from cracks in the earth. Deep river canyons cut through the plateau in places. The *Colorado Plateau* of western Colorado, New Mexico, Utah, and Arizona makes up a second section of this land region. The Colorado River has carved deep canyons through the plateau. The most famous is the Grand Canyon. Its jagged forms and brilliant colors make it one of the natural wonders of the world. The *Basin and Range Region* of Arizona, Idaho, Nevada, New Mexico, Oregon, southern California, Utah, and Wyoming forms a third plateau section. This area is generally too dry for farming, except where irrigation projects have been developed.

Within the Basin and Range Region is the *Great Basin*, a desert area. It covers parts of Oregon, California, Idaho, Utah, Wyoming, and Nevada. Occasional violent rainstorms fill the basin's riverbeds with water. The rivers run full and wild for a short time, and then dry up again. The streams empty into mountain-enclosed desert flats called *playas* or *sinks*, where the water soon soaks into the ground.

Many of the lakes in the Great Basin are simply shallow sheets of salty water. Great Salt Lake, the largest, is about 75 miles (121 kilometers) long and 50 miles (80 kilometers) wide. Its water is from four to seven times as salty as the ocean. Bathers cannot sink in Great Salt Lake because it is so heavy with salt.

The Pacific Ranges and Lowlands. Two mountain ranges—the Sierra Nevada and the Cascade Range—form the eastern boundary of this region. These ranges extend almost the entire length of the Pacific Coast from Canada to Mexico. The mountains are almost as high and rugged as the Rockies. The Columbia River Valley provides the only easy route through the almost unbroken mountain wall. The mountains have great forests and large deposits of minerals, especially gold. They are also a popular recreation area. Many lakes lie high in the mountains, some in the craters of inactive volcanoes.

West of the Sierra Nevada and the Cascade Range is a series of rich valleys. Some of the chief cities of the West lie in these valleys, which are so broad that they seem to be flat plains. The valleys include the San Joaquin-Sacramento River Valley in California, the Willamette River Valley in Oregon, and the lowlands around Puget Sound. Among the important cities that lie in these valleys are Fresno, Portland, Sacramento, Seattle, and Tacoma.

The Coast Ranges rise west of the valleys. At many points, these mountains drop sharply to the Pacific Ocean. But the coastal plain is broad around Los Angeles, one of the great metropolitan areas of the United States. In central California, a break in the Coast Ranges provides an easy route into the San Joaquin-Sacramento River Valley. The cities of San Francisco and Oakland grew up around this break.

The Pacific Coast, unlike the Atlantic Coast, has few bays. The only deep inlets are Columbia River Bay, Grays Harbor, Puget Sound, San Diego Bay, San Francisco Bay, San Pablo Bay, and Willapa Bay. A man-made bay forms a harbor at Los Angeles.

Oregon State Highway Comm.

The Rugged Oregon Coastline near Waldport is part of the Pacific Ranges and Lowlands region. This region extends down the entire length of the Pacific Coast from Canada to Mexico.

Jim Balog, Alpha

Lake Chelatna nestles among slopes of the Alaska Range near Mount McKinley. This range is part of the Pacific Mountain System, which curves from the Aleutian Islands through southern Alaska.

Waipio Valley lies between steep cliffs on the coast of Hawaii in the Hawaiian Islands. The islands have many towering cliffs that rise almost straight up from the water's edge.

Werner Stoy, Camera Hawaii

UNITED STATES / *Climate*

The United States has many kinds of climate because it is such a huge country and has such a great variety of natural features. Some areas are extremely hot, and others are extremely cold. Some areas receive too much rainfall, and others get too little. But most sections have a moderate climate. This moderate climate helped bring about the country's rapid industrial development. It also encouraged the growth of the nation's great agricultural economy. Such areas as Arizona, southern California, Florida, and Hawaii have thriving resort industries because of their mild winters.

Precipitation (rain, melted snow, sleet, and hail) is generally well distributed throughout the United States. However, large areas of the West are dry. Nevada, the driest state, has an average of 7.42 inches (18.85 centimeters) of precipitation annually. Louisiana, the wettest mainland state, has an average of 56.38 inches (143.21 centimeters). The wettest place in the country is Mount Waialeale on Kauai Island in Hawaii. There, rainfall averages 460 inches (1,170 centimeters) yearly. The driest place is Death Valley in California, where the average yearly rainfall is less than 2 inches (5 centimeters). Death Valley is also the hottest place in the United States. The highest temperature ever recorded in the country was 134° F. (57° C), set at Death Valley on July 10, 1913. The lowest recorded temperature was −80° F. (−62° C), registered at Prospect Creek in Alaska in January, 1971. See NORTH AMERICA (Climate). See also the section on Climate in each state article.

Eric M. Sanford

Rich Spring Pastures in Vermont help support the state's dairy cattle. Late in March, the winter snows begin to melt. Late May is the season of lilacs and apple blossoms in Vermont.

Kabel, Publix

Early Summer Flowers bloom on a plantation near Wilmington, N.C. Flowering azaleas and moss-draped trees are common in this subtropical area, which is warmed by gentle ocean breezes.

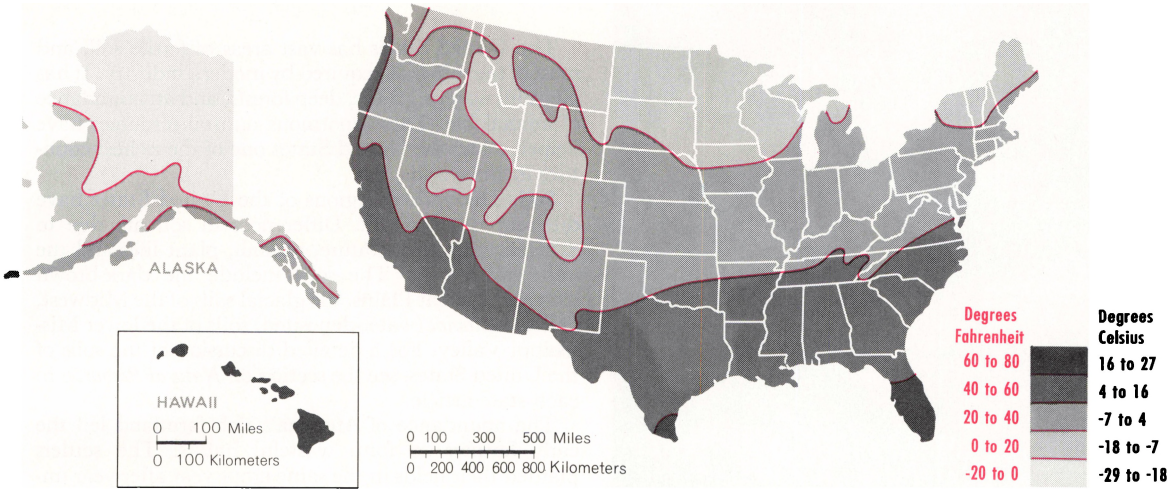
Stewart's Photo

Heavy Winter Snow forms a blanket over much of Alaska. Snowplows clear drifts from the Alaska Highway, *above*. Alaska has longer and colder winters than any other state.

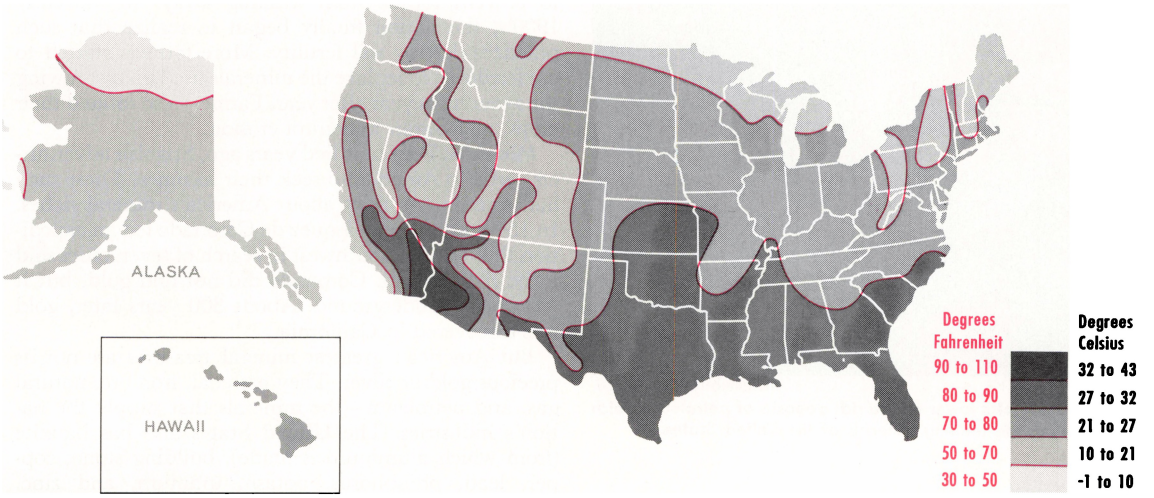
O. Roach, Shostal

Golden Autumn Leaves of Colorado's quaking aspens create a contrast to the snow-capped Rocky Mountains. Hunters come to the area when cold weather forces wildlife down to lower pastures.

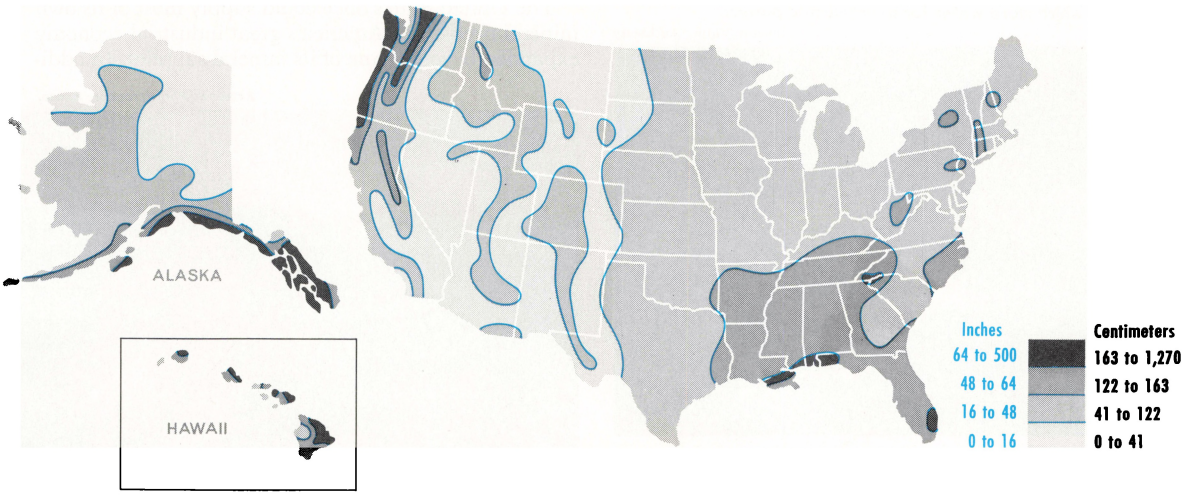
AVERAGE JANUARY TEMPERATURES



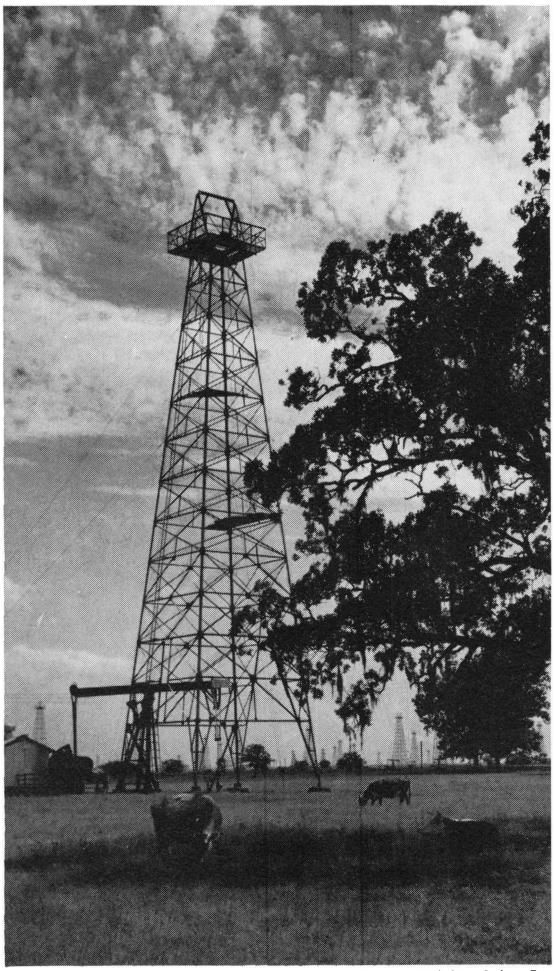
AVERAGE JULY TEMPERATURES



AVERAGE YEARLY PRECIPITATION (Rain, Melted Snow, and Other Moisture)



WORLD BOOK maps

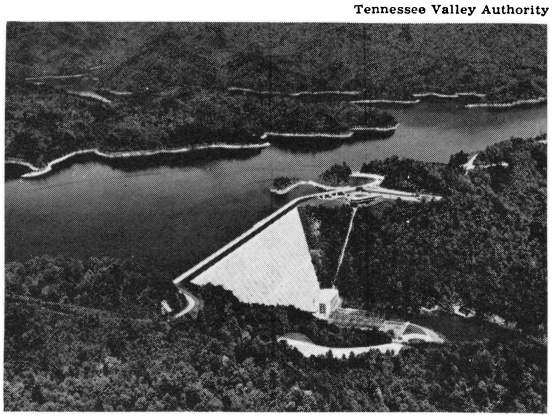


Humble Oil & Refining Co.

Tall Oil Derricks tower above rich deposits of petroleum, which ranks among the leading minerals of the United States.

Fontana Dam in North Carolina is part of the nation's network of dams which store water for hydroelectric power.

Tennessee Valley Authority



Irrigated Farmland in Arizona, *right*, supports crops, and creates a striking contrast to unirrigated desert land, *foreground*.

UNITED STATES / *Natural Resources*

The United States has vast areas of fertile soil, and most of the minerals required by modern industry. It has plentiful water supplies, deep forests, and an abundance of animal life. These enormous natural resources have helped make the United States one of the richest countries in the world.

Soil. The various regions of the United States have different types of soil. Differences in soil are due to differences in temperature, rainfall, plant life, and the underlying rocks. The soils include the dark-brown soils of the Great Plains, the glacial soils of the Midwest, and the *alluvial* (water-deposited) soils of the lower Mississippi Valley. For a detailed discussion of the soils of the United States, see the section on *Natural Resources* in each state article.

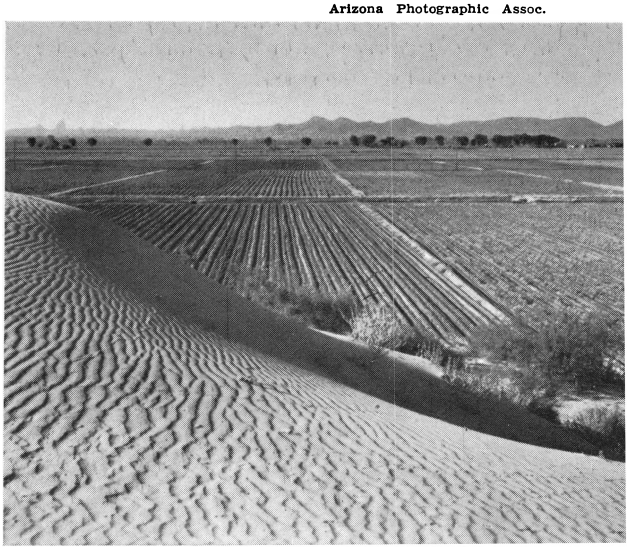
The abundance of America's rich farmland led the early farmers to form wasteful habits. The settlers planted their fields in the same crops year after year until the land began to wear out. Then the farmers moved to fresh land. They plowed the hillsides with little care to prevent topsoil from washing away. In the early 1900's, the nation finally began to realize that such practices destroy soil fertility. More farmers started to use fertilizers to replace the minerals used up by growing the same crops year after year. Farmers also rotated their crops, and began to control erosion.

Minerals. Four hundred years ago, Spanish adventurers came to America to seek their fortunes. These men had romantic notions about America's mineral riches. In 1540, Francisco Vásquez de Coronado led an expedition through the Southwest in search of seven cities said to be rich in gold. Coronado did not find gold, but it was there—underground. About 300 years later, gold was discovered in California.

But America's greatest mineral treasures are not its precious gold or silver. They are coal, iron ore, natural gas, and petroleum—the minerals that supply the nation's industries. The United States also has bauxite (from which aluminum is made), building stone, copper, lead, phosphorus, potash, uranium, and zinc. Without all these minerals, the nation could never have become the industrial giant that it is.

The United States once could supply most of its own mineral needs. But America's great industrial economy expanded beyond some of its mineral supplies. In addi-

Arizona Photographic Assoc.



tion, some mineral deposits, such as the richer ores in the Lake Superior iron ranges, have been used up. Today, the nation must import large amounts of certain minerals. The United States imports some minerals to supplement its own supply. These include bauxite, copper, iron ore, magnesium, petroleum, and uranium. Other minerals must be imported because the nation lacks them completely or because its supplies are too small. They include antimony, cobalt, industrial diamonds, nickel, and tin. See also the section in this article on *Mining*.

Water. Most places in the United States have enough water to meet the needs of the people. The nation uses about 350 billion gallons (1,320 billion liters) of water a day. About 35 per cent of this water goes to irrigate farmland. Industry uses about 55 per cent of it for air conditioning, for various manufacturing operations, and for the production of electric power. City and rural water systems pump about 10 per cent of it for use in homes and small industries. See WATER.

Irrigation has turned many dry areas of the United States into rich farmland. Water used for irrigation may be stored in lakes or behind dams. Or it may be brought from underground by powerful pumps. American farmers irrigate about 39 million acres (16 million hectares) of land. This total area is about equal to that of the state of Georgia. Most of the irrigated land lies between the Great Plains and the Pacific Coast Ranges. See IRRIGATION (Irrigation in the United States).

Hydroelectric Power. Hydroelectric plants produce about one-sixth of the electric power in the United States. The country's hydroelectric plants have a capacity of about 55 million kilowatts of electricity. The United States ranks first in the world in developed hydroelectric power. Both the federal government and private industry have built many high dams to meet the increasing demand for electric power. Some of the dams provide flood control and irrigation as well as power. The nation's largest hydroelectric power stations are at Grand Coulee Dam on the Columbia River and Robert Moses Niagara Power Plant. See DAM; ELECTRIC POWER; WATER POWER.

Forests. When the early colonists landed in America during the 1600's, forests covered almost half the land. The pioneers thought the forests were so vast that they would last forever. The settlers chopped down trees to clear land for crops. They destroyed wide forest areas by wasteful lumbering methods.

After the Atlantic Coast forests had been cleared, the lumber industry moved westward. Lumbering was centered in the Great Lakes area until the late 1800's, when it shifted to the South. It moved to the Far West during the 1920's. Today, the Pacific Coast forests produce almost half the nation's lumber. Alaska has many forests, but most of them are difficult to reach.

Some forests that were destroyed have been replanted. An important reforestation program is being carried out in the pine forests of the South. Such programs help increase timber reserves. But the United States still cuts some of its best timber faster than the trees regrow. See FOREST AND FOREST PRODUCTS.

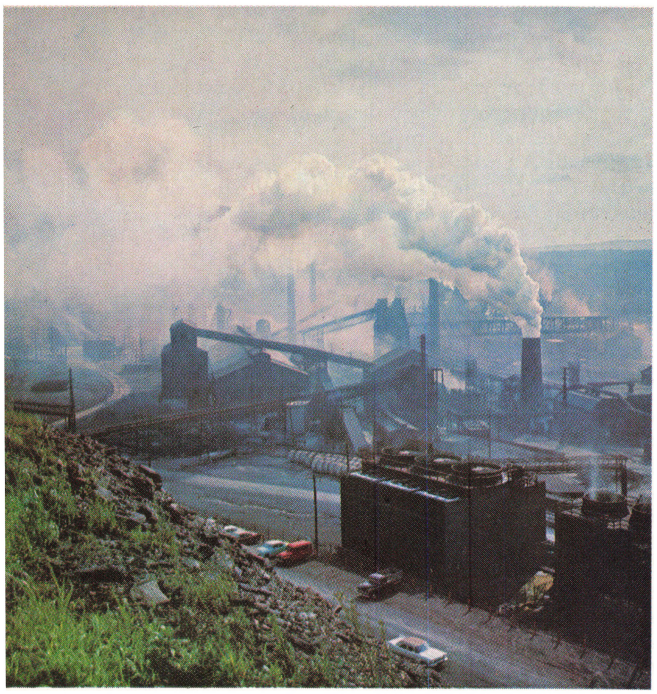
Animal Life. In the pioneer days, wild animals were one of America's chief natural resources. Settlers hunted and trapped them for food, and made clothing from their hides. Frontiersmen pushed far into the interior in search of furs. During the 1800's, buffaloes and much other wildlife were slaughtered recklessly. In the early 1900's, the nation became concerned and began to establish wildlife refuges. Today, there are over 300 federal refuges for animal life. These refuges cover about 30 million acres (12 million hectares). The chief remaining fur-bearing animals of the forest and swamps include beavers, foxes, minks, muskrats, opossums, and raccoons. See WILDLIFE CONSERVATION.

The fish that live in the Great Lakes and off the Atlantic, Pacific, and Gulf coasts are an important natural resource. The coastal waters of New England have excellent fishing grounds, with cod, haddock, herring, mackerel, and other fishes. Menhaden, the nation's greatest single catch, are caught off the South Atlantic and Gulf coasts. Menhaden are used chiefly to make fish oil and meal. Some of the world's largest shrimp fisheries lie off the South Atlantic and Gulf coasts. The Pacific coastal waters of Alaska have countless salmon. Many salmon, tuna, and other fishes are caught in Pacific waters off the California coast.

American fishermen catch about 3 million short tons (2.7 million metric tons) of fish and other seafood every year. The nation has one of the largest commercial fishing industries in the world.

Ray Atkeson

Vast Evergreen Forests blanket the mountainsides near Glacier Peak in northwestern Washington. Trees cover about a third of the land in the United States. Almost half the nation's lumber comes from the Pacific Coast forests. The forest products industry ranks among the largest manufacturing industries in the United States.



K. Snyder, FPG

Large Steel Mills, such as this one in Johnstown, Pa., stand near supplies of coal, used in making iron and steel. The United States is a world leader in the production of steel.

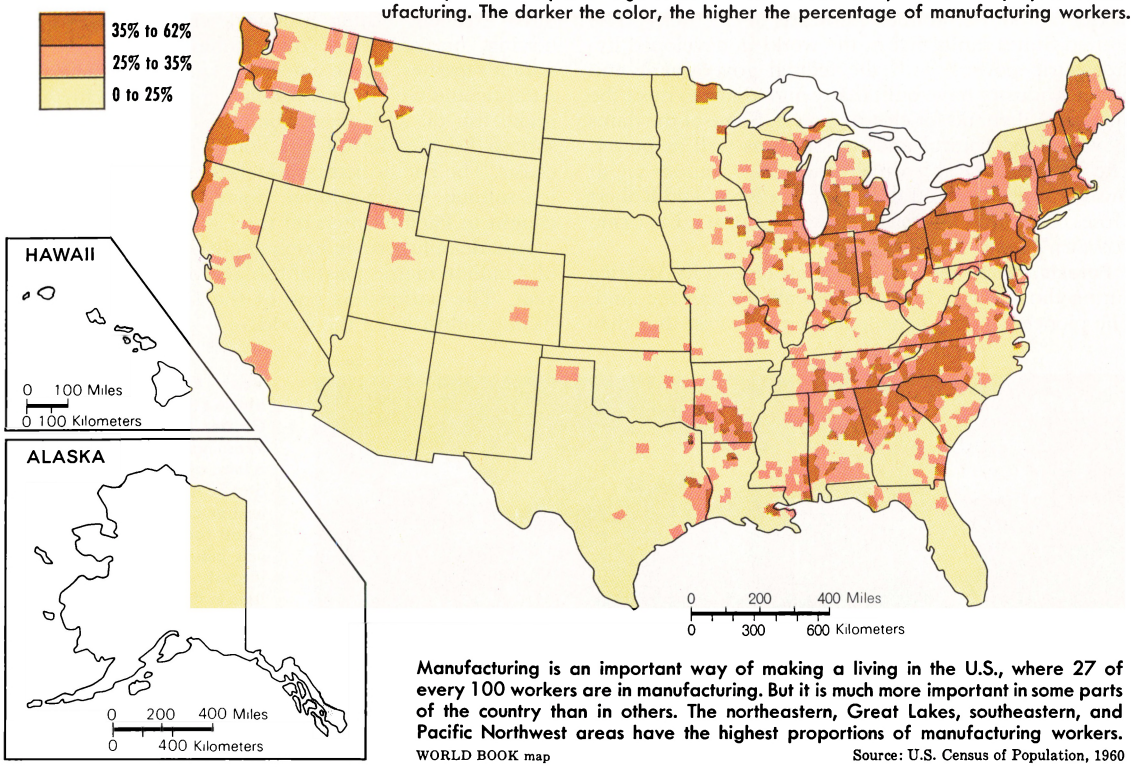
In the United States, private business is free to operate for a profit. Under this *free enterprise system*, the American people have reached the highest standard of living in the history of the world. The system has been abused at various times. But it has stimulated the people to develop the resources of their land. And it has encouraged them to find new and better ways of doing things. See FREE ENTERPRISE SYSTEM.

In colonial America, small companies conducted much of the business. Many of these companies were family firms, operated by a father and his sons. Small business still plays a vital role in the American economy. But through the years, some companies have become gigantic. For example, General Motors, one of the nation's largest industrial corporations, has assets of about $20 billion. The ownership of America's huge industrial and commercial corporations is spread among about 30 million stockholders. About $1\frac{1}{3}$ million persons own shares in General Motors. The stockholders of corporations elect members of the board of directors, who manage the business. See BUSINESS.

Manufacturing accounts for more than three-fourths of the value of all goods produced in the United States. Products manufactured in the United States have a *value added by manufacture* of about $315 billion yearly. This figure represents the value created in products by U.S. industries, not counting such costs as materials, supplies, and fuels.

THE IMPORTANCE OF MANUFACTURING

This map shows the percentage of all workers in each county who are employed in manufacturing. The darker the color, the higher the percentage of manufacturing workers.



Manufacturing is an important way of making a living in the U.S., where 27 of every 100 workers are in manufacturing. But it is much more important in some parts of the country than in others. The northeastern, Great Lakes, southeastern, and Pacific Northwest areas have the highest proportions of manufacturing workers.

WORLD BOOK map

Source: U.S. Census of Population, 1960

The United States is the world's leading manufacturing nation. Its factories turn out more than two-fifths of the Free World's total industrial production. The United States produces about a fifth of the world's steel, the basic metal of industry. It makes about a third of the world's automobiles. It processes about a fifth of the world's meat, and manufactures about two-fifths of its aluminum. The United States is the Free World's leading producer of cheese, clothing, chemicals, paper and paperboard, textiles, and many other products. It ranks first among the countries of the Free World in printing and publishing. The nation's biggest manufacturing industry is transportation equipment. Food processing ranks second. Other leading manufacturing industries in the United States include chemicals, clothing, machinery, metal products, paper and allied products, primary metals, and printing and publishing. See MANUFACTURING.

Manufacturing Centers. New York is the nation's leading manufacturing state, followed by California, Ohio, Illinois, Pennsylvania, and Michigan.

America's first manufacturing centers developed along the rivers of New England. Water power from rushing rivers and plunging waterfalls ran the machines of the factories. After coal became the primary source of power, many factories moved closer to coal areas in Pennsylvania and other states. The great industrial cities of Birmingham, Cleveland, and Pittsburgh grew

Devaney from Publix

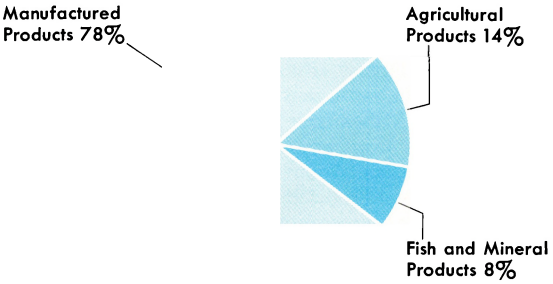
Self-Service Supermarkets offer all kinds of foods in one location. American food stores range from neighborhood groceries to nationwide chains with yearly sales of over $1 billion.

Giant Industrial Firms are owned by thousands of stockholders. The board of directors of the Du Pont Company reports the corporation's financial condition at the annual stockholders' meeting, *below.*

E. I. Du Pont de Nemours & Co., Inc.

PRODUCTION OF GOODS IN THE UNITED STATES

Total value of goods produced in 1971—$400,848,610,000



Percentages are based on farm income, value added by manufacture, and value of fish and mineral production. Fish products are less than 1 per cent.

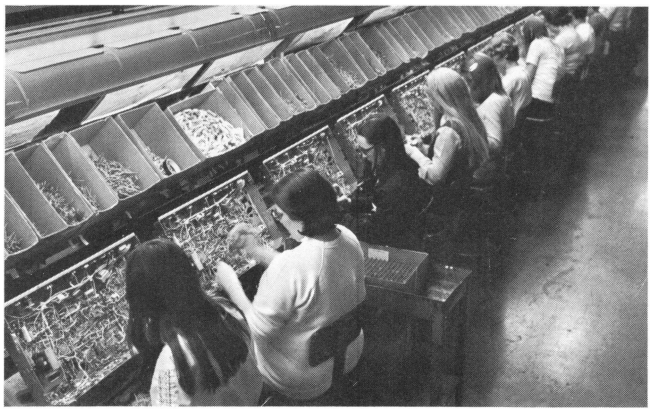
Sources: U.S. government publications, 1971-1973.

EMPLOYMENT IN THE UNITED STATES

Total number of persons employed in 1972—76,380,000

	Number of Employees
Manufacturing	18,933,000
Wholesale & Retail Trade	15,683,000
Government	13,290,000
Community, Business, & Personal Services	12,309,000
Transportation & Public Utilities	4,495,000
Finance, Insurance, & Real Estate	3,927,000
Agriculture	3,615,000
Construction	3,521,000
Mining	607,000

Sources: *Employment and Earnings*, May, 1973, U.S. Bureau of Labor Statistics; U.S. Bureau of Employment Security.



Zenith Radio Corp.

Women on an Assembly Line insert parts into television sets in a manufacturing plant. Assembly lines play a key role in mass production, which allows industries to make goods faster and cheaper than by other methods.

International Harvester *Today*

Automated Machines enable steelworkers to roll and cool steel by merely pushing buttons on a panel. Automation speeds production and saves labor costs.

up close to coal fields. As petroleum and electrical power became important, some industries no longer had to remain near coal supplies. Manufacturers could build their factories in areas where workers or raw materials were plentiful.

Transportation facilities have also influenced the location of industry. Chicago became the leading U.S. industrial center partly because it lies at the tip of Lake Michigan and at the crossroads of the continent. New York City's outstanding transportation facilities, including its incomparable harbor, helped make it the nation's largest city and a great manufacturing center. The Great Lakes also helped make Buffalo, Detroit, and Milwaukee great industrial centers. See the section on *Manufacturing* in each state article.

Mass Production. About 1800, two developments occurred that revolutionized industry. One was the invention of *machine tools* (equipment that shapes metal). The second was the use of *interchangeable* (identical) parts. American industry did not link these two developments with the moving assembly line until the 1900's. When it did, the great era of low-cost mass production began. Henry Ford was a pioneer in mass production. By mass-producing Model T automobiles, he made them cheap enough for many persons to buy. Mass production made the United States the industrial giant of the world and raised the nation's standard of living. See ASSEMBLY LINE; MASS PRODUCTION.

Automation has become increasingly important in American industry. Automation is the use of machines that operate with little or no human control. These machines automatically control other machines that manufacture and assemble products. After World War II, the automobile industry became the first to make widespread use of automation. Today, many industries use automatically controlled machines. Automation is reducing the number of unskilled laborers needed in industry. It is making highly trained workers and engineers even more important to society. Automation increases production, but it also creates problems. For example, workers displaced by machines must be retrained for other jobs. See AUTOMATION.

Research and Development. Industry has always been interested in developing new products and discovering better manufacturing techniques. U.S. companies have over 5,000 research laboratories for these purposes. The laboratories employ about 400,000 men and women, and spend over $10 billion yearly for scientific research. Industrial research is an important part of the nation's research program. It supplements research conducted by government, by universities and colleges, and by private foundations. See RESEARCH.

Agriculture. The United States is one of the world's leading agricultural nations. America's farm products have a value of about $57 billion yearly. American farmers produce about 50 per cent of the world's corn, 25 per cent of its oats, 20 per cent of its cotton, 17 per cent of its chickens and tobacco, 15 per cent of its wheat, and 10 per cent of its hogs.

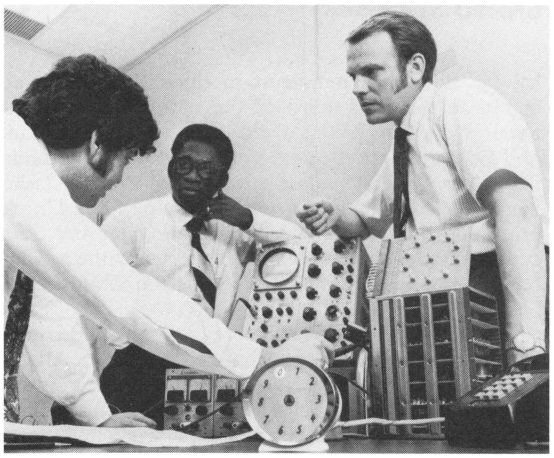
The Agricultural Revolution. In 1850, about three-fifths of the workers in the United States made their living in agriculture. Today, less than 5 per cent of the workers—about $3\frac{1}{2}$ million persons—make their living on farms. They raise most of the nation's livestock, food crops, and industrial crops. They also produce large quantities for export to other countries.

The increased use of machines and scientific farming methods permits fewer and fewer farmers to feed more and more people. In 1820, each American farmer raised enough food to feed himself and three others. Today, each farmworker grows enough food to feed 52 persons. American farmers use tractors, seeders, cultivators, harvesters, and other machines. This equipment makes it possible for only a few persons to operate a large farm. Modern farming methods include the use of improved fertilizers and disease-resistant plants, crop rotation, and scientific breeding and feeding of livestock. American farmers produce so much that finding a market for some products is often a problem.

About 85 per cent of the nation's farmers own or partly own the farms on which they live. The rest rent their land. Farms in the United States vary greatly in size. The average size was about 381 acres (154 hectares) in the early 1970's. This average is constantly in-

Grant Heilman

Dairy Cattle feed on chopped silage on a farm in Pennsylvania. Dairy and beef cattle are the most important livestock raised on American farms. Many farmers also raise hogs and chickens.



Authenticated News Int.

Electronics Engineers experiment with a device that permits telephone "dialing" by voice. They are among the many types of researchers who develop products and manufacturing methods.

creasing as farms become more and more mechanized.

During the Great Depression of the 1930's, the federal government set up a number of programs to protect the farmer against low prices, to control crop surpluses, and to encourage soil conservation. These goals are still part of the federal farm program.

Crops are raised on about 273 million acres (111 million hectares) of land in the United States. Crops and farming methods have always differed throughout the country because of differences in climate and soil. On the rocky land of New England, the early farmers raised crops mainly for their own households. Later, their small farms produced dairy products and poultry for the nearby cities. But in the Southern Colonies, farmers found that the soil, climate, and level land of the coastal plain favored tobacco and cotton. The raising of these crops led to a system of large farms and plantations. In the Midwest, pioneers found the broad, fertile land suited to a variety of grains and hay. Today, this region has more than half the nation's cropland, though it covers only a fifth of the United States.

The most important U.S. crop is corn, both in acreage planted and in dollar value. Other leading crops, in order of value, include soybeans, wheat, cotton, tobacco, greenhouse and nursery products, sorghum grain, and hay. American farmers also raise barley, dry beans, fruits, oats, peanuts, potatoes and other vegetables, rice, sugar beets, sugar cane, and many other crops.

Livestock. More than a fourth of the land area of the United States is used for pasture and grazing. Most of this land is in the Great Plains, where too little rain falls for raising crops. About 160 million acres (65 million hectares) of public lands in 11 Western states are divided into *grazing districts*. These districts are used by private ranchers under permits from the U.S. Department of the Interior. See PUBLIC LANDS.

Dairy and beef cattle are the most important livestock raised on American farms. Farms in the Midwest, and the enormous ranches of the West, raise most of the beef cattle. The great American Dairy Belt extends across the northern United States from New England to Minnesota. Most of the country's hogs come from the Corn Belt of the Midwest. Almost all American farmers keep small flocks of chickens to supply their families with meat and eggs. Some farmers specialize in raising huge flocks of meat-producing or egg-laying chickens. See AGRICULTURE; FARM AND FARMING.

Mining has an annual value of about $30 billion in the United States. The value of petroleum output is about 40 per cent of the value of all minerals produced in the country. Natural gas is the second most valuable product, and coal ranks third. The United States produces about 15 per cent of the world's crude petroleum, about 60 per cent of its natural gas, and about 20 per cent of its coal.

Industry's need for more and more minerals is a constant challenge to the mining industry to make new discoveries. Prospectors once located deposits with pick and shovel. Today, mining and drilling firms employ highly trained engineers and geologists to locate new deposits. These experts also work to discover new ways of refining low-grade ores once considered useless.

The petroleum industry is an outstanding example of the success in using scientific methods of discovery. Since 1900, experts have often predicted that the United States would use up its petroleum reserves in a few years. But new oil fields have continually been discovered. Engineers have also developed better ways of pumping petroleum from the earth, and thus reopened some abandoned fields. In the 1920's, the United States had about 7 billion barrels of known petroleum reserves. Today, it has about 34 billion barrels.

The U.S. mining industry has done much to improve the working conditions of miners. At the same time, it has increased their production. In coal mining, for example, machines have replaced much of the back-breaking toil. Better ventilation and other improvements have made the mines safer and more pleasant places in which to work. In the 1970's, the average miner in America's *bituminous* (soft) coal mines produced almost five times as much coal as that produced by the average miner in 1920. See MINING.

Petroleum and Natural Gas. Only Russia produces more petroleum than the United States. Texas is

by far the chief petroleum-producing state. It accounts for about a third of the nation's output and about 7 per cent of the world's production. Louisiana and California are the next most important oil-producing states. Other leading producers include Alaska, New Mexico, Oklahoma, and Wyoming. The United States also produces more natural gas than any other country. Texas supplies about 40 per cent of the nation's output, and has about 35 per cent of the total reserves. See GAS; PETROLEUM.

Coal. Only Russia mines more coal than the United States. The nation's largest coal deposits are in Alaska, Illinois, Montana, and North Dakota. But nine states east of the Mississippi River produce about 90 per cent of the coal mined. The leading coal-producing states, in order of importance, are Kentucky, West Virginia, Pennsylvania, Illinois, Ohio, Virginia, Indiana, Alabama, Tennessee, and New Mexico. Pennsylvania has the only large *anthracite* (hard coal) deposits. See COAL.

Iron. Over three-fourths of the nation's iron ore comes from the Lake Superior fields of Michigan, Minnesota, and Wisconsin. The soft ore is shipped by large lake boats and railroad cars to such steel centers as Chicago and Pittsburgh. Alabama, New York, Utah, and several other states also have iron ore deposits. The best grades of ore in the Lake Superior fields have been largely used up. But methods for processing low-grade ores, such as taconite, have been developed. Some steel companies import iron ore from Canada, Venezuela, and other countries. About a third of the iron ore used in the United States is imported. See IRON AND STEEL.

Copper. The United States produces more copper than any other country. The leading copper-mining state is Arizona, which produces half the nation's output. Utah, the second largest copper producer, mines about a fifth of the country's supply. Other copper-producing states include Michigan, Montana, Nevada, and New Mexico. See COPPER.

Aluminum is made from an ore called bauxite. Mines in Arkansas produce about 90 per cent of the bauxite mined in the United States. Bauxite is also mined in Alabama and Georgia. See ALUMINUM.

Zinc and Lead are often found and mined together. The United States is one of the leading zinc-producing countries. Tennessee is the chief zinc-producing state, and Missouri is first in lead production. Other top zinc producers are Colorado, Idaho, Missouri, New Jersey, New Mexico, New York, Pennsylvania, and Utah. Other lead-mining states include Colorado, Idaho, New Mexico, Utah, and Virginia. See ZINC; LEAD.

Gold and Silver. Arizona, Colorado, Nevada, South Dakota, Utah, and Washington mine most of the nation's gold. The chief silver-producing states are Arizona, Idaho, Montana, and Utah. See GOLD; SILVER.

Construction Industry. During the early 1970's, Americans built new homes at a rate of over 2 million a year. They also erected many new buildings and factories to house their growing business and industrial activities. More than 3½ million persons earn their living in the building and construction industry.

To keep pace with the demand for new homes, the building industry has developed new methods of construction. Many builders have erected huge housing projects, which permit economical use of equipment and labor. Such parts as window frames and doorways are often assembled in factories to save on-the-site labor. Many houses are manufactured by sections in factories, and are simply assembled on the building site. They are called *prefabricated* houses. In the early 1970's, about a fifth of the new homes being constructed were prefabricated. About a fifth of the new homes were *mobile homes* (house trailers). These are popular with workers and military personnel who must often move about the country. See HOUSING.

E. I. Du Pont de Nemours & Co., Inc.

Giant Beams and Girders form the steel skeleton of a new industrial plant. Riveters and welders fasten the pieces in place. Over 3½ million persons work in the U.S. construction industry.

Trade. The United States has a greater volume of international trade than any other country. And its domestic trade is about 8 times as great as its trade with other countries. About 16 million Americans earn their living in wholesale and retail trade. The businesses that conduct this trade range from huge wholesale firms and department stores to corner groceries. Each region of the United States produces chiefly the products for which it is best suited. It sells surplus products to other regions that need them. The nation's annual domestic trade has a value of about $365 billion in wholesale trade and about $500 billion in retail trade.

In the early 1970's, the United States imported more than $45 billion worth of goods from other countries and exported over $43 billion worth of goods annually. The nation's most important trading partner by far is Canada. The United States sends about a fourth of its exports to Canada. Canada, in turn, supplies the United States with over a fourth of its imports. Other U.S. trading partners, in order of importance, are Japan, West Germany, and Great Britain. The United States also trades with Belgium, France, Italy, Luxembourg, Mexico, The Netherlands, Venezuela, and other nations.

The leading exports of the United States, in order of value, are machinery and transportation equipment, food and live animals, crude materials (such as cotton, ores, and soybeans), and chemicals. The leading imports, in order of value, are machinery and transportation equipment, mineral fuels and lubricants, and food and live animals. See TRADE.

Los Angeles Chamber of Commerce

A Cloverleaf Interchange in Los Angeles connects five freeways. U.S. streets and highways cover about 3,800,000 miles (6,100,000 kilometers). About 125 million motor vehicles use them.

UNITED STATES/*Transportation and Communication*

Transportation. The regions of the United States are linked by an immense system of airlines, railroads, roads and highways, and waterways. The broad country and its transportation system grew up together. The Midwest was only an outpost of the East Coast until waterways linked the two regions. The wild frontier of the West vanished quickly after the first railroad spanned the continent. Modern industrial America grew up along the routes of the railroads. Then automobiles and trucks, traveling on all-weather highways, spread the settlement of America more evenly throughout the country. Finally, the airplane brought almost every community in the nation within a few hours' travel time of every other community. See TRANSPORTATION.

Aviation. About 35 domestic airlines operate in the United States. The leading airlines connect all the large cities. The smaller cities are served by *feeder* lines that connect with a major air center.

Domestic airlines carry about 207 million passengers yearly. They are also increasingly important in transporting cargo. Domestic airlines fly about 6 billion ton-miles of express and freight yearly. A ton-mile is 1 short ton (0.9 metric ton) carried 1 mile (1.6 kilometers). Thirteen U.S. airlines operate international flights. The airlines of many other countries also serve the United States. See AIRLINE; AIRPLANE; AVIATION.

Railroads were largely responsible for the settlement and development of the West. They carried farmers, merchants, and miners across the prairies to the western frontier lands. By 1869, railroads covered much of the eastern half of the United States. That year, the first transcontinental rail route was completed, linking the Atlantic and Pacific coasts. Today, the United States has about 209,000 miles (336,000 kilometers) of railroads. Airlines and highways have reduced the importance of railroads in carrying passengers. But railroads are still the main carriers of freight. See RAILROAD.

Roads and Highways. The street and highway systems of the United States cover about 3,800,000 miles (6,100,000 kilometers), of which about 3 million miles (4,800,000 kilometers) are surfaced. About 125 million motor vehicles use these systems. Highways are built by local, state, and federal governments. The federal government first took the responsibility of road building in 1811. That year, the government began to build the National, or Cumberland, Road through the Appalachian Mountains. Today, the federal government finances most of the interstate highway system. The states handle construction work on these highways, and have the main responsibility for their own networks of state roads. Most states also help with local road construction. See ROADS AND HIGHWAYS.

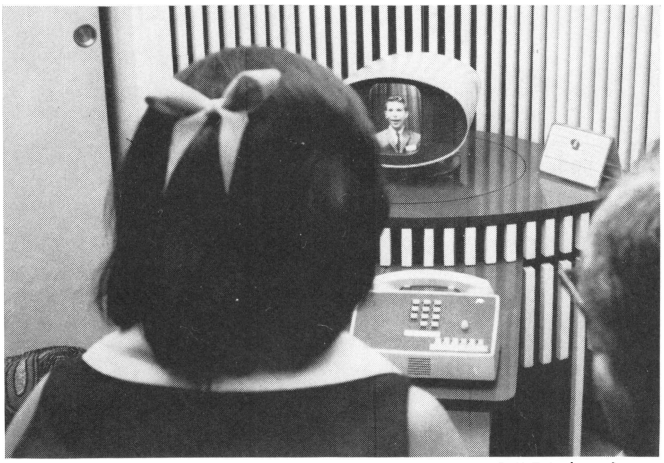
Waterways and Ports. America's outstanding network of inland waterways has always been vital to the nation's growth and progress. Early settlers crossed the Appalachian Mountains to the headwaters of the Ohio River. Then they floated down the Ohio and built settlements along its banks. Later, the settlers transported their produce down the Ohio to the Mississippi River, and then on to New Orleans. In 1825, the Erie Canal was completed in New York. It linked the Hudson River with Lake Erie, and spurred the settlement and commercial growth of the entire Great Lakes area.

Today, oceangoing ships can sail up the St. Lawrence Seaway and through the Great Lakes to Chicago. There, the Chicago River and the Chicago Sanitary and Ship Canal form important links in a waterway to the Mississippi River. Thus, the United States has an all-water route from the Atlantic Ocean, through the Midwest, to the Gulf of Mexico. The Missouri River, the great branch of the Mississippi, extends this waterway into much of the western Interior Plains. Agricultural and industrial products are carried on the waterway to coastal cities and to other countries. See INLAND WATERWAY.

Two other important waterways lie along the Atlantic and Gulf coasts. They are the Atlantic Intracoastal Waterway and the Gulf Intracoastal Waterway. Short canals connect many of the lakes, rivers, bays, and lagoons near these coasts, and form protected water routes. See ATLANTIC INTRACOASTAL WATERWAY; GULF INTRACOASTAL WATERWAY.

The United States depends on ocean shipping for most of its trade with other countries. The nation's fleet of merchant ships is the seventh largest in the world in tonnage. The Port of New York is the nation's busiest seaport. Other major American ports on the Atlantic include Baltimore, Boston, Norfolk Harbor, Philadelphia, and Portland. The leading United States ports on the Great Lakes include Chicago, Detroit, Duluth-Superior, and Toledo. The leading Gulf ports include New Orleans, Houston, and Baton Rouge. Major ports on the Pacific include Long Beach, Los Angeles, and Richmond in California, as well as Portland and Seattle. See PORT; SHIP.

Communication. The Founding Fathers of the United States believed that a free exchange of ideas was vital to a democracy. As a result, the United States Constitution includes guarantees of freedom of speech



Bell Telephone System

The U.S. Communications Industry provides such modern equipment as the Picturephone. This device lets people see each other while talking.

and freedom of the press. Upon these freedoms, the United States has built a vast communication system. See COMMUNICATION.

Publishing. Publishers in the United States issue almost 2,000 daily newspapers, about 9,000 weeklies, and about 16,500 magazines of all kinds. U.S. newspaper publishers print over 60 million copies each day.

Every year, the book industry publishes about 40,000 new books and new editions. The United States ranks high among the countries of the world in the total number of different kinds of books that are published.

The U.S. publishing industry operates without government censorship or license. Individual publishers are regulated only by their own consciences, by libel laws, and by the public that buys their products. The nation's main publishing center is New York City. Other leading publishing cities include Boston, Chicago, Cleveland, Los Angeles, Philadelphia, San Francisco, and Washington, D.C. See BOOK; MAGAZINE; NEWSPAPER; PUBLISHING.

Radio, like publishing, is chiefly a private business in the United States. Unlike publishers, however, radio

UNITED STATES / *Study Aids*

Related Articles. See the separate article on each state with its *Related Articles*. See also the following:

EDUCATION

Education
School
Universities and Colleges

HISTORY AND GOVERNMENT

City Government
Congress of the United States
Constitution of the United States
Democracy
Government
Local Government
President of the United States
State Government
Supreme Court of the United States
United States, Government of the
United States, History of the
Vice-President of the United States

INDUSTRIES AND PRODUCTS

For the rank of the United States among other countries in production, see the following articles:

Agriculture
Aluminum
Automobile
Barley
Cattle
Cheese
Chemical Industry
Clothing
Coal
Copper
Corn
Cotton
Electric Power
Fishing Industry
Flax
Forest and Forest Products
Gas
Gold
Horse
Iron and Steel
Lead
Leather
Lemon
Lumber
Manufacturing
Mining
Oats
Orange
Paper
Petroleum
Platinum
Potato
Publishing
Rubber
Rye
Salmon
Salt
Ship
Silver
Sugar
Sugar Beet
Sugar Cane
Textile
Tobacco
Tuna
Tungsten
Uranium
Vegetable
Wheat
Wine
Zinc

NATIONAL FORESTS, PARKS, AND MONUMENTS

See the tables with the following articles:

National Forest
National Park System

OUTLYING AREAS

American Samoa
Canton and Enderbury Islands
Caroline Islands
Guam
Johnston Island
Line Islands
Mariana Islands
Marshall Islands
Midway Island
Panama Canal Zone
Puerto Rico
Virgin Islands
Wake Island

PHYSICAL FEATURES

See DAM; LAKE; MOUNTAIN; RIVER, with their lists of *Related Articles*.

REGIONS

Middle Atlantic States
Midwestern States
New England
Pacific Coast States
Rocky Mountain States
Southern States
Southwestern States

SOCIAL AND CULTURAL LIFE

American Literature
Architecture
Art Museum
Book
Christmas
Dancing
Easter
Holiday
Library
Motion Picture
Museum
Music
Painting
Recreation
Religion
Sculpture
Theater

OTHER RELATED ARTICLES

Air Force, United States
Army, United States
Bicentennial Celebration, American
Census
Citizenship
City
Clothing
Coast Guard, United States
Conservation
Farm and Farming
Flag
Food
Housing
Immigration and Emigration
Marine Corps, United States
Minority Group
Money
Navy, United States
RAND Corporation
Segregation
Transportation

Outline

I. People
- A. Population and Ancestry
- B. Cities
- C. Farms
- D. Family Life
- E. Religion
- F. Recreation

II. Education
- A. Schools
- B. Libraries
- C. Museums
- D. Scientific Research

III. The Arts

IV. Land Regions
- A. The Appalachian Highlands
- B. The Coastal Lowlands

stations are licensed and regulated by the federal government. Individual stations have freedom to operate as they wish, provided they serve the public interest. Radio stations are supported by the money they receive from advertisers who buy time to broadcast sales messages. The United States has about 7,500 radio stations. Nearly all American homes have at least one radio. See RADIO.

Telephone and Telegraph. The United States has more than 125 million telephones. Americans make an average of more than 470 million telephone calls a day, and use hundreds of millions of miles or kilometers of telephone wires. This telephone system is efficient as well as huge. For example, a person in New York City can dial a friend in Los Angeles and get him on the phone in less than a minute. See TELEPHONE.

Telephones have replaced the telegraph for many purposes. Since 1935, the mileage of telegraph wires in the United States has been reduced by more than half. Today, the United States has about 400,000 miles (640,000 kilometers) of telegraph wires. These wires are used to carry telegraph messages, to transmit photographs, and to operate teletype machines. They also carry time signals. See TELEGRAPH.

Television was developed commercially by the radio industry. Radio companies own many television stations. Most television programs are financed in the same manner as radio programs—by the sale of time to advertisers. Some schools and private organizations operate educational television stations on a nonprofit basis. These groups present educational television programs on a wide variety of subjects. Some high school and college courses are presented on television for students in their homes.

The nation's first regular television broadcasts started in 1939 in New York City. Two years later, the first regular commercial broadcasts began. Today, the United States has about 900 television stations. About 96 of every 100 American homes have a television set. See TELEVISION.

JOHN GUNTHER

Critically reviewed by JEWELL A. PHELPS

C. The Interior Plains
D. The Ozark-Ouachita Highlands
E. The Rocky Mountains
F. The Western Plateaus, Basins, and Ranges
G. The Pacific Ranges and Lowlands

V. Climate

VI. Natural Resources
A. Soil
B. Minerals
C. Water
D. Forests
E. Animal Life

VII. Economy
A. Manufacturing
B. Agriculture
C. Mining
D. Construction Industry
E. Trade

VIII. Transportation and Communication

Questions

How does the United States rank among the countries of the world in population? In area?

Of every 100 homes in the United States, about how many have a television set?

What country is the chief trading partner of the United States?

How much has the life expectancy of Americans increased since 1900?

Where is the driest place in the United States? The wettest place?

Why is the United States known as a *melting pot?*

How much of the free world's industrial production comes from U.S. factories?

What are the leading crops raised in the United States?

Why has the farm population of the United States declined so sharply since 1850?

What is the most important mineral produced in the United States?

Books for Young Readers

EGGENBERGER, DAVID. *Flags of the U.S.A.* Enl. ed. Crowell, 1964.

HOFFMAN, EDWIN D. *Pathways to Freedom: Nine Dramatic Episodes in the Evolution of the American Democratic Tradition.* Houghton, 1964.

LOBSENZ, NORMAN M. *The First Book of National Monuments.* Rev. ed. Watts, 1968.

ROSS, FRANK X. *Stories of the States: A Reference Guide to the Fifty States and the U.S. Territories.* Crowell, 1969.

WOOD, LEONARD C., and GABRIEL, R. H. *America: Its People and Values.* Harcourt, 1971.

Books for Older Readers

BROGAN, DENIS W. *The American Character.* Peter Smith, 1956.

CALLISON, CHARLES H., ed. *America's Natural Resources.* Rev. ed. Ronald, 1967.

DODDS, JOHN W. *Life in Twentieth Century America.* Ed. by Louis B. Wright. Putnam, 1973.

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HANDLIN, OSCAR, ed. *This Was America.* Harvard, 1969.

HART, JOHN F., ed. *Regions of the United States.* Harper, 1972.

HOAG, EDWIN. *American Houses: Colonial, Classic, Contemporary.* Lippincott, 1964.

KRYTHE, MAYMIE R. *What So Proudly We Hail: All About Our American Flag, Monuments and Symbols.* Harper, 1968.

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NATIONAL GEOGRAPHIC SOCIETY. *America's Wonderlands: The Scenic National Parks and Monuments of the United States.* The Society, 1959. *America's Historylands: Touring Our Landmarks of Liberty.* 1967. *Vacationland U.S.A.* 1970.

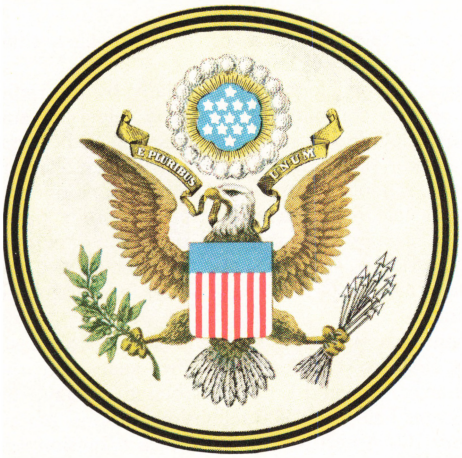
PATERSON, JOHN H. *North America: A Geography of Canada and the United States.* 4th ed. Oxford, 1970.

SCHLESINGER, ARTHUR M., and WHITE, M. G., eds. *Paths of American Thought.* Houghton, 1963.

This Fabulous Century. 8 vols. Time Inc., 1969-70.

TOCQUEVILLE, ALEXIS DE. *Democracy in America.* There are many editions of this book, which is a basic interpretation of American life.

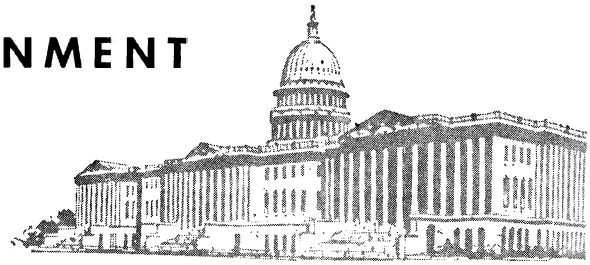
U.S. BUREAU OF THE CENSUS. *Statistical Abstract of the United States.* U.S. Government Printing Office. Published annually. A useful collection in one volume of information on all aspects of American life.



Symbols of the United States include the national seal, *left*, the U.S. Constitution, and the Declaration of Independence. The eagle on the Great Seal of the United States holds an olive branch and some arrows. The olive branch stands for the nation's desire for peace, and the arrows symbolize the ability of the United States to defend its security. The seal was adopted in 1782. The Declaration of Independence and the Constitution provide the basis of the United States government. Both documents are displayed, *below*, in the National Archives Building in Washington, D.C. The Declaration is in an upright case above the Constitution.

U.S. Dept. of State; WORLD BOOK photo

UNITED STATES GOVERNMENT



UNITED STATES, GOVERNMENT OF THE. The government of the United States represents, serves, and protects the American people at home and abroad. From the nation's capital in Washington, D.C., its activities and influence reach every part of the world.

The three branches of the United States government—executive, legislative, and judicial—are usually represented by the President, Congress, and the Supreme Court. Generally speaking, the President enforces the laws that Congress passes, and the Supreme Court interprets these laws if any question arises.

United States military forces stationed in many parts of the world support American policy and help preserve peace. Representatives of the government work in international organizations, provide technical assistance, and negotiate with other governments. Millions of civil service employees and other workers at home and abroad carry out the programs of the government.

The United States government shares governmental powers with the states under the *federal* system established by the United States Constitution. The national governments of most other countries are *unitary* (centralized). They have final authority in all matters, and grant limited powers to state and local governments.

Government in the United States operates on three levels: national, state, and local. The federal government in Washington cannot abolish the states or rearrange their boundaries. It can exercise only powers that are delegated or implied by the Constitution. The states exercise powers reserved to them or not denied them by the Constitution. In some areas, the federal and state governments have *concurrent* powers. That is, they both have the right to exercise authority. The American judicial system keeps the federal and state governments within their proper fields of power.

The United States government makes and enforces laws, collects taxes, provides services for the people, protects individuals and their property, and works for national and international security. But it is noted for the way it encourages the people to take part in government, seeks to protect the rights of the people from the government itself, and assures the self-government of the states. Abraham Lincoln described the United States government in his Gettysburg Address as being "of the people, by the people, for the people."

For a description of the United States, its history, and its Constitution, see UNITED STATES; UNITED STATES, HISTORY OF THE; CONSTITUTION OF THE UNITED STATES.

Government in American Life

The United States government, through its activities, services, and authority, directly affects the lives of the American people in many ways. It collects taxes and customs duties to finance government work. It borrows money and issues bonds. It coins money and prints currency. It establishes uniform weights and measures. It issues patents and copyrights. It controls immigration and emigration, and naturalizes noncitizens. It operates the postal system, and builds roads and highways. It manages a social security system. It has powers to regulate agriculture, business, and labor through its authority to regulate interstate commerce. It negotiates with other governments, and participates in international organizations to promote peace, health, and education. It has the power to declare war and to conclude peace pacts. It maintains the armed forces and can draft citizens for military service. It admits new states into the union. It governs the District of Columbia and the territories, including American Samoa, Guam, the Panama Canal Zone, and the Virgin Islands. It also governs islands in the Pacific Ocean under a United Nations trusteeship.

The United States seeks not only to govern, but also to protect the liberty of the states and the people. The Bill of Rights in the Constitution guarantees that all persons shall have freedom of speech and of religion, freedom of the press, the right of assembly, and freedom from arbitrary interference by the federal government. It guarantees a person freedom from arbitrary arrest and imprisonment. It also guarantees the right to trial by jury and justice in the federal courts. The government acts to see that no state deprives any person of life, liberty, or property without due process of law, or denies equal protection of the law. See BILL OF RIGHTS.

The Executive Branch

The executive branch of the United States government consists of (1) the Executive Office of the President, (2) the executive departments, and (3) the independent agencies.

The President of the United States is the nation's chief executive and chief of state. He lives in the White House in Washington, D.C., and has offices there. As chief executive, he has the responsibility of enforcing federal laws. He appoints and removes high federal officials. He commands the armed forces. He conducts foreign affairs. He recommends to Congress the laws he would like to have passed. He appoints American representatives to international organizations and to diplomatic missions in other lands. As chief of state, the President performs many ceremonial duties. The people elect the President to a four-year term, and he cannot be elected to more than two terms.

The Executive Office of the President includes: (1) the White House Office, (2) the Office of Management and Budget, (3) the National Security Council, (4) the Council on Economic Policy, (5) the Council of Economic Advisers, (6) the Office of the Special Repre-

sentative for Trade Negotiations, (7) the Community Services Administration, (8) the Domestic Council, (9) the Council on Environmental Quality, (10) the Office of Telecommunications Policy, (11) the Council on International Economic Policy, (12) the Special Action Office for Drug Abuse Prevention, (13) the Federal Property Council, (14) the Energy Resources Council, and (15) the Council on Wage and Price Stability. See PRESIDENT OF THE UNITED STATES (The Executive Office).

Executive Departments conduct the administration of the national government. These 11 departments are: (1) State, (2) Treasury, (3) Defense, (4) Justice, (5) Interior, (6) Agriculture, (7) Commerce, (8) Labor, (9) Health, Education, and Welfare, (10) Housing and Urban Development, and (11) Transportation. Department heads are appointed by the President, with the approval of the Senate. They form the *Cabinet* (see CABINET). Ten are called *secretaries*. The attorney general heads the Department of Justice.

Each executive department has a deputy or undersecretary and two or more assistant secretaries. The President appoints these officials, and may remove them without giving any reason. High officials usually resign when a new President takes office.

Generally, each executive department is divided into bureaus, bureaus into divisions, divisions into branches, branches into sections, and sections into units. Most officials below the highest level serve under civil service appointments (see CIVIL SERVICE). All executive departments have headquarters in Washington, but about 90 of every 100 employees work in *field services* (activities that are not a part of headquarters).

Independent Agencies developed with the growth of government regulation. They operate in the fields of aeronautics and space, atomic energy, banking and finance, civil service, communications, farm credit, home loans, information services, interstate commerce, labor mediation and conciliation, labor relations, power, railroad retirement, science, securities and exchange, selective service, small business, tariffs, trade, and veterans affairs. Administrators or directors head most of the agencies. But the regulatory agencies, such as the Interstate Commerce Commission, are headed by several persons of equal rank, although one may serve as chairman. They usually have legislative, judicial, and administrative duties. The President appoints the members of these agencies with Senate approval. He must state reasons for removing them.

The Legislative Branch

The legislative branch of the United States government includes Congress, which consists of the Senate and the House of Representatives. This branch also includes six administrative agencies: (1) the Architect of the Capitol, (2) the Congressional Budget Office, (3) the General Accounting Office, (4) the Government Printing Office, (5) the Library of Congress, and (6) the United States Botanic Garden.

The Senate and the House of Representatives meet in separate chambers in the Capitol in Washington. Congress makes, repeals, and amends federal laws. Congress also levies federal taxes and appropriates funds for the government. See CONGRESS OF THE UNITED STATES.

The Senate has 100 members. Each state, regardless of size or population, has two senators, who serve six-year terms. The Vice-President of the United States presides over the Senate. The Senate has certain exclusive powers. It alone can sit as a court of impeachment to try federal officials impeached by the House of Representatives. It alone has the power to approve the President's nominations for major federal offices. It alone can ratify treaties with other nations. See SENATE.

The House of Representatives consists of 435 members. A state's representation is based on population. It ranges from California's 43 members to one each from Alaska, Delaware, Nevada, North Dakota, Vermont, and Wyoming. The number of representatives from a state changes as its population changes. Reapportionment takes place every 10 years, after the national census. Only the House can bring charges of impeachment against high federal officials. It alone can initiate tax bills. See HOUSE OF REPRESENTATIVES.

The Judicial Branch

The Supreme Court of the United States is the highest court in the land. It has a chief justice and eight associate justices. The President appoints all justices with the approval of the Senate. The justices hold office for life. See SUPREME COURT OF THE UNITED STATES.

Other Federal Courts. About 90 federal *district courts* are located in various cities. Above the district courts are 11 federal *courts of appeals*, often called *circuit courts*. Above the courts of appeals is the Supreme Court. Decisions of a district court may be appealed to an appeals court, and from the appeals court to the Supreme Court. Federal courts decide cases that involve the Constitution and federal laws. Judges of these courts hold office for life. The President appoints them with the approval of the Senate. See COURT.

Principles of American Government

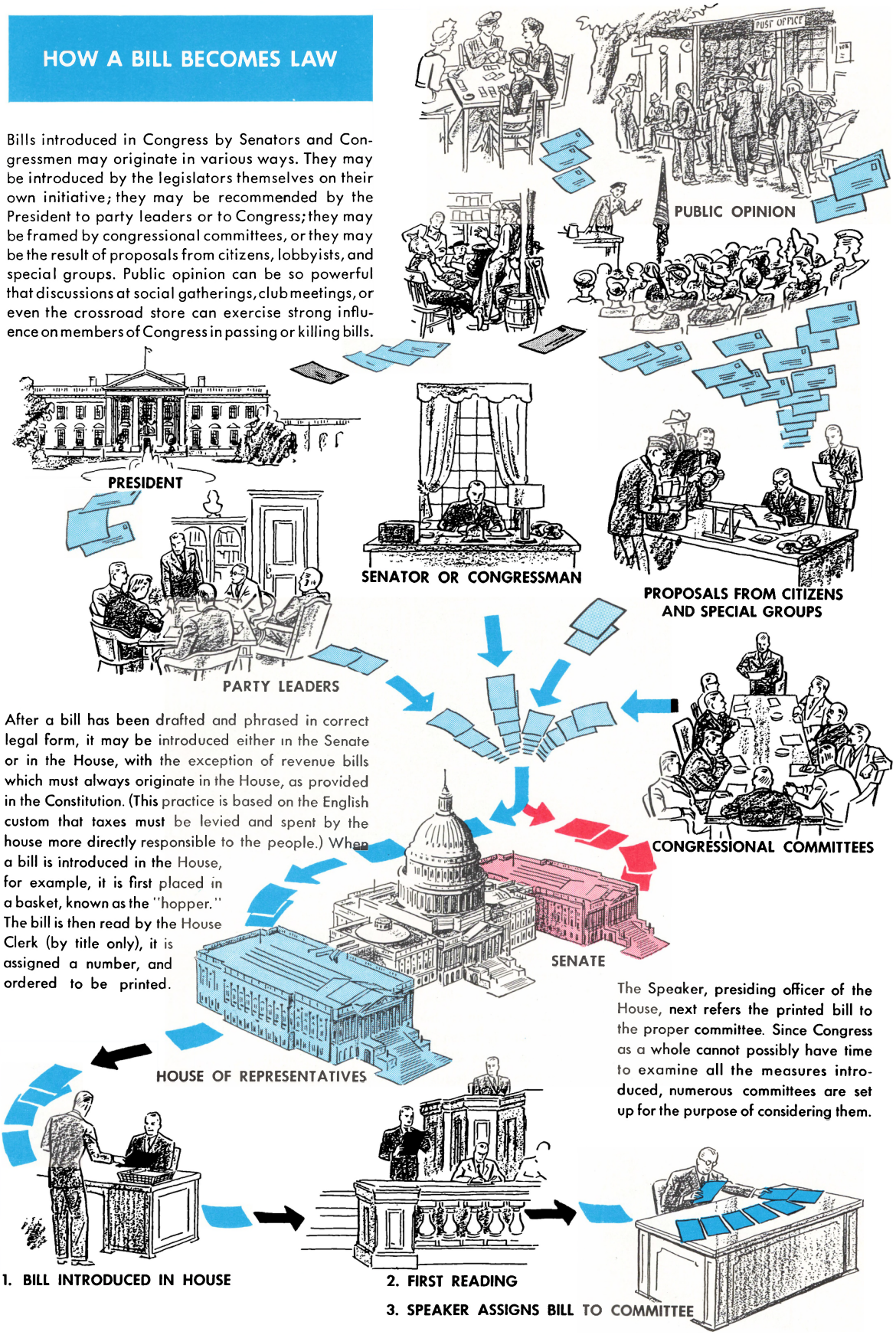
Separation of Powers. The Constitution divides the powers of the United States government among the executive, legislative, and judicial branches. Each branch is generally independent of the other two, and has the authority to check or balance the others. *Checks and balances* give each branch some powers that affect the other two. For example, Congress holds a check over the President with its authority to make government appropriations. It checks the courts with its powers to organize courts and create rules for their procedures. One of the President's checks on Congress is his power to veto bills. He influences the federal courts by the kind of judges he appoints. The courts can check the President and Congress by declaring executive orders and legislative acts unconstitutional.

A Written Constitution provides the basis of government in the United States. It divides powers and duties between the federal and state governments. It specifies the powers of each branch of the national government. A written constitution is one of the unique contributions the American people have made to the art of government. British royal governors had ruled the colonies in America under written charters granted by the king. The idea of adopting a written constitution as the basic law of an independent country was entirely new.

The Constitution not only grants powers, but also

HOW A BILL BECOMES LAW

Bills introduced in Congress by Senators and Congressmen may originate in various ways. They may be introduced by the legislators themselves on their own initiative; they may be recommended by the President to party leaders or to Congress; they may be framed by congressional committees, or they may be the result of proposals from citizens, lobbyists, and special groups. Public opinion can be so powerful that discussions at social gatherings, club meetings, or even the crossroad store can exercise strong influence on members of Congress in passing or killing bills.

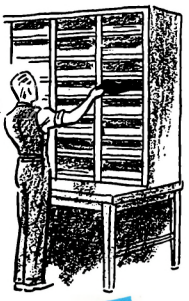


After a bill has been drafted and phrased in correct legal form, it may be introduced either in the Senate or in the House, with the exception of revenue bills which must always originate in the House, as provided in the Constitution. (This practice is based on the English custom that taxes must be levied and spent by the house more directly responsible to the people.) When a bill is introduced in the House, for example, it is first placed in a basket, known as the "hopper." The bill is then read by the House Clerk (by title only), it is assigned a number, and ordered to be printed.

The Speaker, presiding officer of the House, next refers the printed bill to the proper committee. Since Congress as a whole cannot possibly have time to examine all the measures introduced, numerous committees are set up for the purpose of considering them.

4. HOUSE COMMITTEE CONSIDERS

5. BILL FILED AND PLACED ON CALENDAR



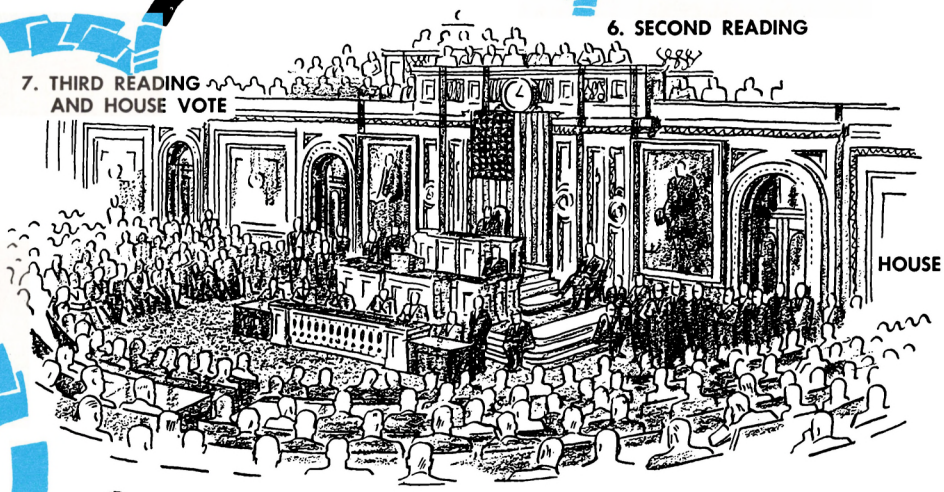
OR

The committee may report the bill favorably; amend, revise, or rewrite it completely; or lay it on the table. If tabled, as is the case with the majority of bills, it is forgotten unless forced to the floor by a majority vote of House members, or reintroduced in a succeeding session of Congress. If the bill is reported favorably, it is put on a House Calendar to await its turn for consideration, unless it is an emergency measure or is unusually important. In that case, the House Rules Committee has the power to push it ahead of other bills already on file.

HOUSE RULES COMMITTEE MAY PUSH BILL AHEAD

6. SECOND READING

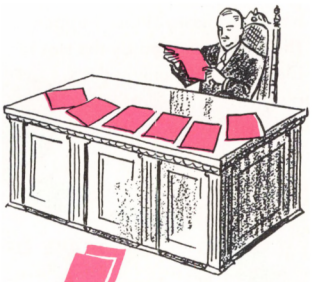
7. THIRD READING AND HOUSE VOTE



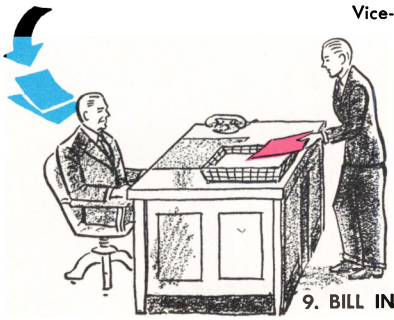
HOUSE CHAMBER

8. SPEAKER SIGNS BILL

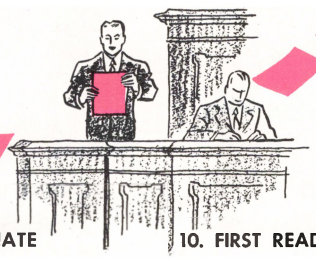
After reaching the floor of the House, the measure is given a second reading, in full. Congressmen study printed copies of it, and friends and foes speak for or against it, debate being limited. At this stage, the bill may be amended or returned to the committee for revision before a vote is taken. If the majority votes for the bill, it then comes up for third reading (by title only), and another vote is taken. If the bill is passed, it is attested by the House Clerk and sent to the Senate. There the Senate Clerk reads it (by title only). Then the Vice-President assigns the bill to a committee for study.



11. VICE-PRESIDENT ASSIGNS BILL TO COMMITTEE



9. BILL INTRODUCED IN SENATE



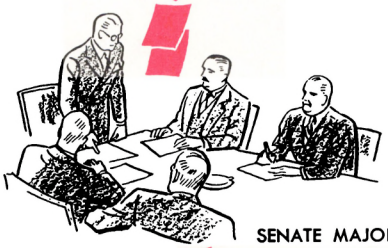
10. FIRST READING IN SENATE

12. SENATE COMMITTEE CONSIDERS

Although some committee meetings are not public, open hearings are held for many important bills. When the bill comes out of committee, it is either filed and put on the Senate Calendar to await its turn or is pushed ahead by the Senate majority leaders. After reaching the Senate floor, it is read in full, debated without time limits unless the Senate imposes such limits, and brought to a vote. If it is passed, it is read a third time (by title only) and again put to a vote and passed before it is sent to the Vice-President for his signature.

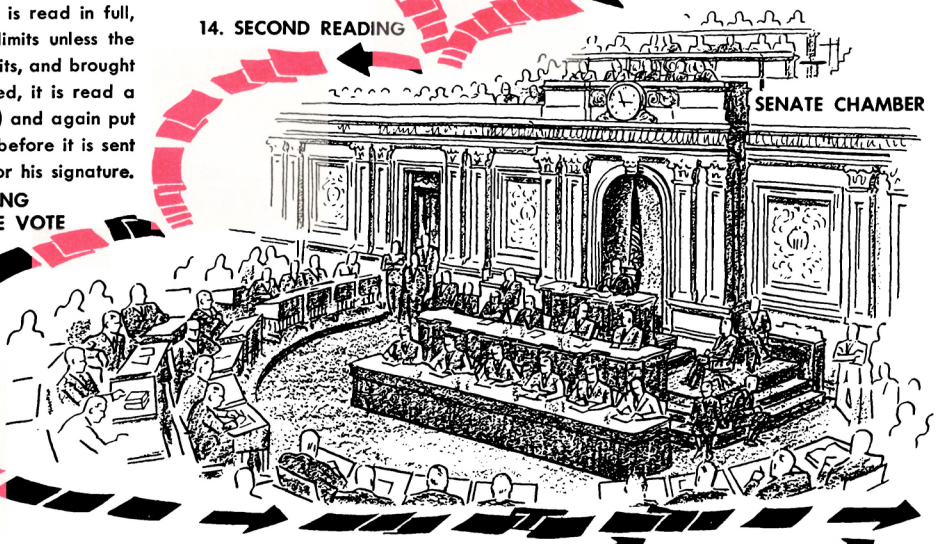
13. BILL FILED AND PLACED ON CALENDAR

OR



SENATE MAJORITY LEADERS MAY PUSH BILL AHEAD

14. SECOND READING



SENATE CHAMBER

15. THIRD READING AND SENATE VOTE

OR

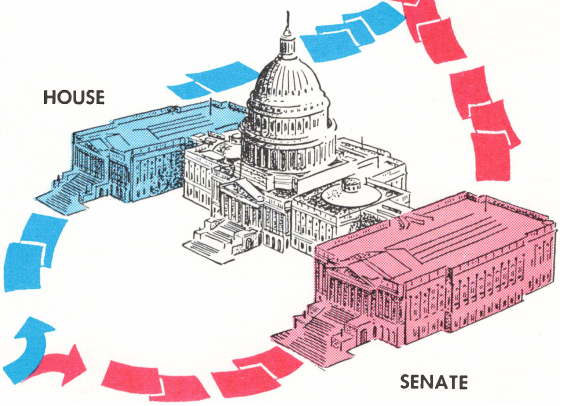
16. HOUSE DEBATE ON AMENDMENTS

If the Senate amends the bill, it is returned to the House for approval or for further revision.

When the amendments are not approved by the House, a conference committee, composed of members from both houses, is appointed to reconcile the differences. When agreement is reached, the revised bill is sent back to the House and Senate for their final approval.

17. CONFERENCE COMMITTEE RECONCILES DIFFERENCES

18. AMENDED BILL APPROVED



20. WHITE HOUSE

After the Speaker and Vice-President sign the bill, it then goes to the President for his signature.

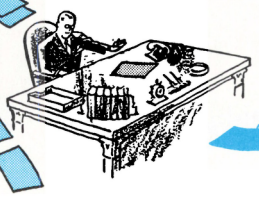
19. SPEAKER AND VICE-PRESIDENT SIGN BILL

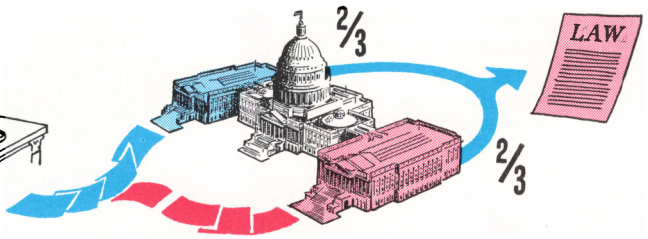
21. PRESIDENT SIGNS BILL

If the bill is approved by the President, he signs it and it becomes the law of the land.

22. BECOMES LAW WITHOUT PRESIDENT'S SIGNATURE

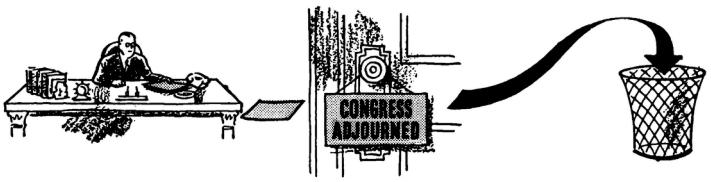
The bill automatically becomes law if the President holds it for ten days (excluding Sundays) without signing or vetoing it. Failure to sign shows that the President disapproves part of the bill, but will not prevent its passage.





23. BILL IS VETOED

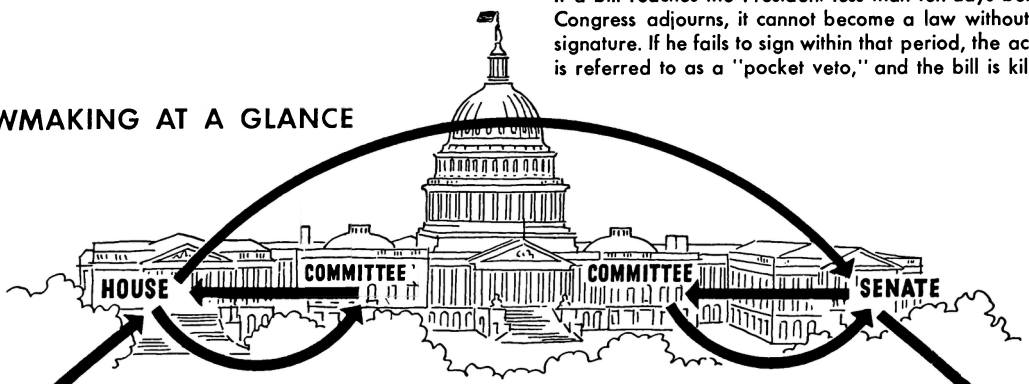
When the President vetoes a bill, it is returned to Congress with a message explaining his objections. To become law, the bill must pass both houses of Congress again, with a two-thirds majority. Few measures command a two-thirds vote to become law over the veto.



24. POCKET VETO

If a bill reaches the President less than ten days before Congress adjourns, it cannot become a law without his signature. If he fails to sign within that period, the action is referred to as a "pocket veto," and the bill is killed.

LAWMAKING AT A GLANCE



A bill introduced in the Senate follows the same procedure as that illustrated for a bill introduced in the House.

limits them. However, it does not answer all questions. For example, who in the government is to say that a state is trying to use a power that belongs to the federal government? Who is to say that the federal government is attempting to exercise a power that belongs to the states? Who is to say that the President, Congress, or the Supreme Court are acting unconstitutionally?

Judicial Review is the method used to answer the basic question: Who is to say what the Constitution means in cases of dispute? Courts have the power to declare legislative acts and executive orders (1) constitutional, or legal; or (2) unconstitutional, or illegal.

Judicial review confines the state and national governments within their constitutional limits. Generally, the state courts interpret the state constitutions, and federal courts interpret the United States Constitution. The Supreme Court can declare unconstitutional executive orders and legislative acts of the federal or the state governments. The Constitution clearly states that it and all federal laws and treaties are the supreme law of the land.

Popular Sovereignty allows the American people to change the Constitution. Congress initiates amendments to the Constitution. A proposed amendment must have the approval of two-thirds of both the Senate and the House of Representatives. It then goes to the states for their approval. Congress may call a national convention to propose amendments, if two-thirds of the state legislatures request it. The amendment becomes a part of the Constitution after legislatures or conventions in three-fourths of the states have ratified it. The American people may adopt an entirely new constitution by calling a new constitutional convention, like the one at Philadelphia in 1787. If such a convention were held, the constitution it adopted would be sent to the states for approval. It would become effective when ratified in the same way as an amendment.

Political Parties and Elections

The American people have a strong voice in their government. They can exercise their democratic rights by voting in national, state, and local elections, and by working in political parties and campaigns.

The Two-Party System. The United States has two major political parties, the Democratic and the Republican. Both parties receive support from individuals and groups in all parts of the country. Members of these two parties hold almost all the offices in the national, state, and local governments.

Minor political parties of the United States rarely elect candidates to government offices. They serve chiefly to call attention to problems that the major parties may have neglected. Often, one or both of the major parties may then attempt to solve such a problem. Then the third party, which brought attention to the problem, may disappear. See POLITICAL PARTY.

National Elections to elect a President and Vice-President are held every four years on the first Tuesday after the first Monday in November. All members of the House of Representatives and about one-third of the members of the Senate are elected at this same time. Between the presidential elections, all of the representatives and another one-third of the senators are elected. This election is held on the same day in November in even-numbered years.

Federal and state laws regulate elections and the qualifications of voters. Most states hold *primary* elections in which party members nominate candidates for state and local offices. Some states use the primary to nominate candidates for Congress. National political conventions nominate candidates for President and Vice-President. See POLITICAL CONVENTION; PRIMARY ELECTION.

Presidential elections are held to select electors to the Electoral College (see ELECTORAL COLLEGE). Each state has as many electors as the total of its senators and representatives in Congress. The District of Columbia has three electors. The electors usually vote for the candidate who receives the most votes in their state. A candidate for President must receive a majority of the electoral votes to be elected.

The Development of American Government

English Background. The United States inherited many government practices from the English rulers of colonial days. In England, the people, particularly in the middle classes, had fought their kings to win the right to representative government. They had also won civil rights and liberties that would protect them and their property from arbitrary acts of government.

The English colonists brought with them the ideas of representative government and civil liberties when they came to America. American frontier life produced much individual independence and self-reliance because of the equal opportunity offered each person. Representative government and many civil liberties became even broader than they had been in Great Britain.

Early American Government. The colonies became states after the Declaration of Independence in 1776. They founded the first independent general government in the United States under the *Articles of Confederation* (see ARTICLES OF CONFEDERATION). Under the Articles, the 13 states guarded their individual powers so strictly that they failed to give Congress the power to tax or to regulate interstate and foreign commerce. Congress could not even create an army without asking the state governments for men and money. Such leaders as George Washington, Benjamin Franklin, James Madison, and Alexander Hamilton feared that the weak national government would collapse. They led a constitutional convention in Philadelphia in 1787 that wrote the United States Constitution. The document was ratified by the first nine states by June, 1788, and went into effect in 1789.

The Constitution gave the national government more powers than it had possessed under the Articles of Confederation. The federal government exercises these powers directly over the people, not through the state governments, as it had done under the Articles.

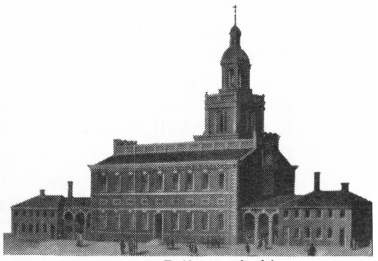
The Growth of American Government. Congress gave the western territories of the United States local representative government as they grew in population. The Northwest Ordinance, passed under the Articles of Confederation in 1787, became a model for future territorial governments (see NORTHWEST ORDINANCE). After a territory had enough people, Congress admitted it into the Union as a state.

The United States purchased Alaska in 1867, and in

CAPITOLS OF THE UNITED STATES

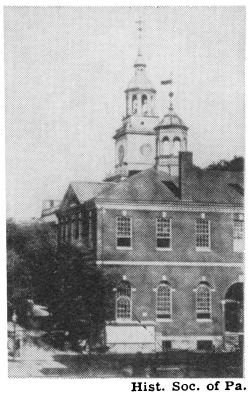
Three Lions

1 CARPENTERS' HALL, PHILADELPHIA (1774)



Bettmann Archive

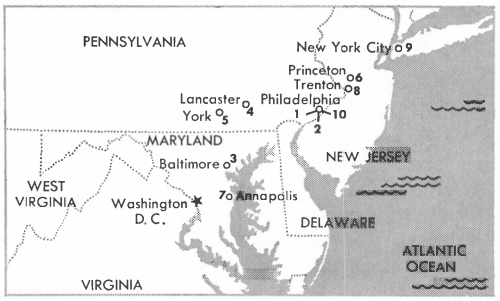
2 INDEPENDENCE HALL, PHILADELPHIA (1775-1776; 1777; 1778-1783)



Hist. Soc. of Pa.

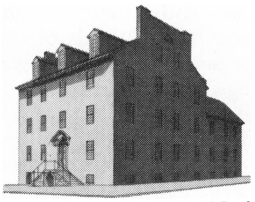
10 CONGRESS HALL, PHILADELPHIA (1790-1800)

The Government met in various cities between 1774 and 1800. The Continental Congress and, later, the Congress of the United States met in the buildings shown here. In 1800, the government moved into the first Capitol in Washington, D.C., which developed by 1863 into the stately, white-domed building we know today.



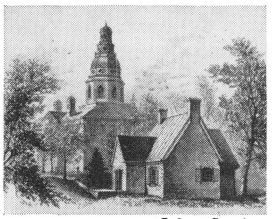
Schoenfeld Collection, Three Lions

9 FEDERAL HALL, NEW YORK CITY (1785-1790)



First Trenton National Bank

8 FRENCH ARMS TAVERN, TRENTON, N.J. (1784)



Culver Service

7 STATE HOUSE, ANNAPOLIS, MD. (1783-1784)

1898 it acquired Puerto Rico, Hawaii, and the Philippines. At first, these territories did not receive as democratic and representative a government as the other territories within the borders of the United States. But the Philippines gained full independence in 1946. Puerto Rico became a commonwealth in 1952. Alaska and Hawaii became the 49th and 50th states in 1959.

Problems of Government. Since 1789, all governments—national, state, and local—have taken on more powers and duties. They have been forced to do so by the increase in population, the growth of cities and towns, the development of industries, and the growth of transportation and communications. Problems that were once local, such as conservation and transportation, have become national. The belief has developed that people should use government and other organizations to provide themselves with services, such as social security, made possible by modern wealth and science. As a result, the federal government has grown even faster than the state and local governments.

Many persons object to the expansion of federal authority, particularly over state and local matters. Others insist that public interest demands federal rather than state control in cases that involve more than one state. When conflicts arise, the courts must decide how to balance the rights of the states with the needs of the national government.

WILLIAM G. CARLETON

Related Articles in WORLD BOOK include:

EXECUTIVE DEPARTMENTS

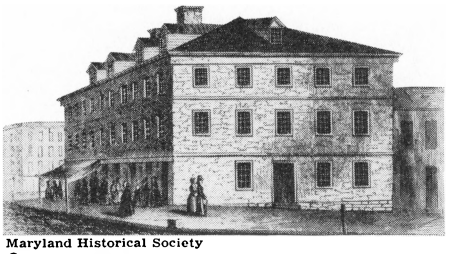
Agriculture, Department of
Commerce, Department of
Defense, Department of
Health, Education, and Welfare, Department of
Housing and Urban Development, Department of
Interior, Department of the
Justice, Department of
Labor, Department of
State, Department of
Transportation, Department of
Treasury, Department of the

EXECUTIVE OFFICE OF THE PRESIDENT

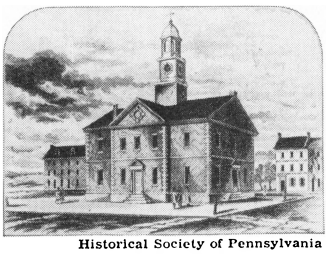
Domestic Council
Economic Advisers, Council of
Economic Opportunity, Office of
Management and Budget, Office of
National Security Council
President of the United States

INDEPENDENT AGENCIES

Atomic Energy Commission
Civil Aeronautics Board
Civil Service Commission
District of Columbia
Environmental Protection Agency
Export-Import Bank of Washington
Farm Credit Administration
Federal Communications Commission
Federal Deposit Insurance Corporation
Federal Mediation and Conciliation Service
Federal Power Commission
Federal Reserve System
Federal Trade Commission
Fine Arts, Commission of
General Services Administration
Indian Claims Commission

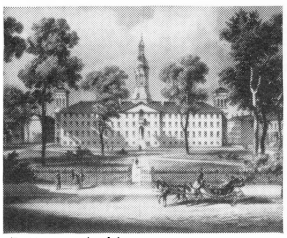


Maryland Historical Society
3 CONGRESS HALL, BALTIMORE (1776-1777)

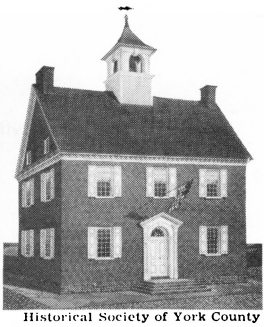


4 OLD COURT HOUSE, LANCASTER, PA. (1777)

Historical Society of Pennsylvania



Bettmann Archive
6 NASSAU HALL, PRINCETON, N.J. (1783)



Historical Society of York County
5 YORK COUNTY COURT HOUSE, YORK, PA. (1777-1778)

Interstate Commerce Commission
National Aeronautics and Space Administration
National Foundation on the Arts and the Humanities
National Labor Relations Board
National Mediation Board
National Science Foundation
Nuclear Regulatory Commission
Postal Service, United States
Railroad Retirement Board
Securities and Exchange Commission
Selective Service System
Small Business Administration
Tariff Commission, United States
Tax Court, United States
Tennessee Valley Authority
United States Information Agency
Veterans Administration

Judicial Branch

Court of Appeals
Court of Claims
Court of Military Appeals
Customs Court, U.S.
District Court
Supreme Court of the United States
Territorial Courts

Legislative Branch

Congress of the United States
General Accounting Office
Government Printing Office
House of Representatives
Library of Congress
Senate
Vice-President of the United States

Symbols of Government

Columbia
E Pluribus Unum
Flag
Great Seal of the United States
Liberty, Statue of
Liberty Bell
Pledge to the Flag
Star-Spangled Banner
Uncle Sam

Other Related Articles

American's Creed
Ballot
Bill of Rights
Census
Citizenship
City Government
Civil Service
Constitution of the United States
County
Court
Democracy
Electoral College
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Immigration and Emigration
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Money
National Debt
Naturalization
Political Party
Presidential Succession
Public Lands
Radio Free Europe
Social Security
Spoils System
State Government
States' Rights
Statuary Hall
Tariff
Taxation
Territory
United States, History of the
United States Capitals
Veto
Voice of America
Voting
Washington, D.C.
White House
Yankee

Outline

I. Government in American Life
II. The Executive Branch
- A. The President
- B. Executive Departments
- C. Independent Agencies

III. The Legislative Branch
- A. The Senate
- B. The House of Representatives

IV. The Judicial Branch
- A. The Supreme Court B. Other Federal Courts

V. Principles of American Government
- A. Separation of Powers
- B. A Written Constitution
- C. Judicial Review
- D. Popular Sovereignty

VI. Political Parties and Elections
- A. The Two-Party System B. National Elections

VII. The Development of American Government
- A. English Background
- B. Early American Government
- C. The Growth of American Government
- D. Problems of Government

Questions

How does the United States government differ from most other national governments?

What are the three branches of the United States government?

What is *popular sovereignty? Judicial review?* Why are they important in the United States government?

How does each branch of the government exercise its powers of checks and balances?

How does the United States Constitution divide powers among the national and state governments?

What is an *independent agency?* What does it do?

How did the ideas of representative government develop in the colonies?

What steps must be taken to amend the United States Constitution?

What are two exclusive powers of the House of Representatives?

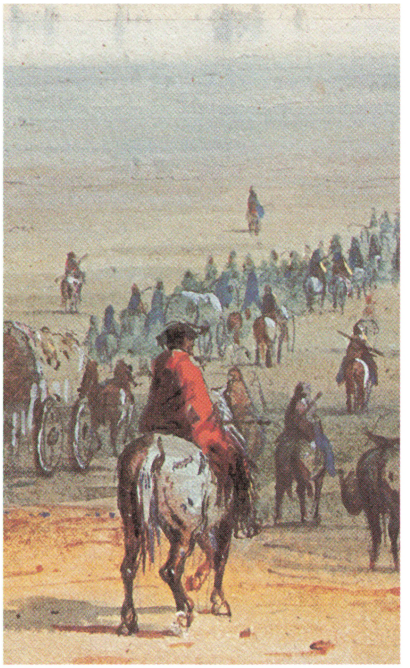
What are some typical questions of government left unanswered by the United States Constitution?

Reading and Study Guide

See *United States Government* in the Research Guide/Index, Volume 22, for a *Reading and Study Guide.*

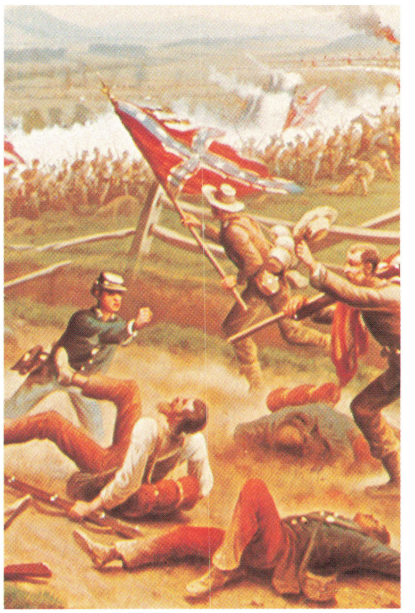
Kennedy Galleries, Inc.

Independence



Walters Art Gallery

The Westward Movement



West Point Museum

The Civil War

The History of the United States spans 200 years. It is an exciting tale of the birth and growth of one of the world's freest, richest, and most powerful nations.

UNITED STATES HISTORY

UNITED STATES, HISTORY OF THE. The history of the United States is the story of a great nation that was carved out of a wilderness by a brave and freedom-loving people. The men and women who built the United States came from almost every part of the world. They represented many different nationalities, races, and religions. Through the years, the people and their descendants learned to live and work together, and to take pride in being Americans. This spirit of cooperation and pride helped make the United States the huge, powerful, and wealthy nation it is today. It also helped the country and its people survive many challenges and hardships—including dangers in the wilderness, wars, social turmoil, and economic depressions.

Background

As late as the 1400's, Indians and Eskimos were the only inhabitants of the Western Hemisphere. During the next 200 years, people from several European countries sailed across the Atlantic Ocean to North and South America. Among them were colonists—chiefly British—who settled along the eastern coast of North America between what are now Maine and Georgia. These hard-working colonists built up a series of thriving permanent settlements in the wilderness. They lived under British rule for many years. But their dedication to liberty led them to declare their independence and form the United States of America in 1776.

Growth and Expansion

The American people dedicated their new nation to the principles of democracy, freedom, equality, and opportunity for all. From the start, the United States welcomed immigrants to its shores. Attracted by the opportunity for freedom and a chance for a better life, newcomers from many lands poured into the United States by the millions. Immigration and natural growth caused the country's population to mount steadily—from fewer than 3 million in 1776 to more than 200 million today.

As the population grew, the American people spread out across North America. Wherever they went, these pioneers worked hard to turn the wilderness into a place where they could earn a living. They formed thriving farms in places where the soil was good. They searched for minerals and other valuable resources, and established towns where they found resources. Cities grew up along the main transportation routes and business and industry prospered there.

America's rapid growth made it one of the world's largest nations in both size and population. The country's bustling economic activity turned it into a land of enormous wealth.

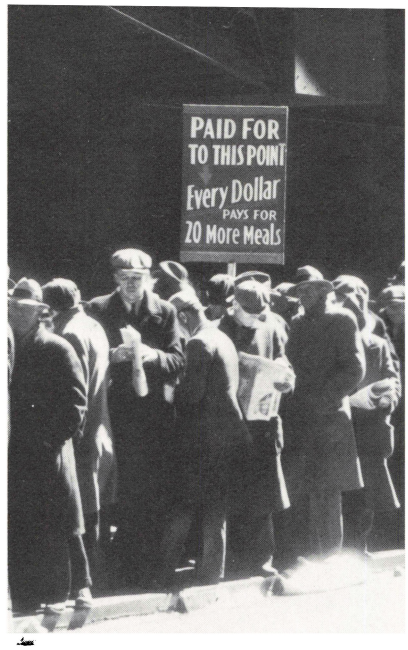
Today, the United States ranks as the world's leading producer of farm products and manufactured goods, and its people have the highest standard of living in the world. The United States also became a world leader in many other fields, including science, medicine, technology, and military strength.

Challenges and Hardships

The United States grew and prospered in spite of many challenges and hardships. At the start, the very survival of the new nation was in doubt. The colonists

The Metropolitan Museum of Art

Industrialization



Brown Bros.

The Great Depression

NASA

The Space Age

who founded the United States had to defeat the mighty British Empire in the Revolutionary War to make their claim to independence stick. They succeeded despite great odds against them.

Both the colonists and the pioneers who moved westward across the country faced many dangers, including disease, starvation, and attacks by Indians. In the 1860's—less than 100 years after the Revolution—the survival of the United States was threatened again. Eleven Southern states withdrew from the Union and tried to establish an independent nation. The tragic, bloody Civil War between the North and the South followed. The North won the Civil War and the country remained united.

The American ideals of equality and opportunity for all did much to help the United States grow and prosper. Yet the ideals have not always been followed in practice. From colonial times until the end of the Civil War, many black Americans were slaves. In addition, some Americans have suffered from discrimination in jobs and other areas because they were immigrants, or because of their race or religion.

America's economic growth, though amazingly rapid, has not always been smooth. Periodically, severe depressions have brought the economy to a near standstill. At such times, large numbers of Americans lost their jobs and lived in poverty.

During the 1900's, the United States became one of the world's strongest military powers. As such, it took on the role of defending democracy throughout the world. This role led the United States into two World Wars and other conflicts. In the mid-1900's, many Americans began protesting against their country's military role, while others defended it. This issue led to bitter disputes among the people.

Today, like always, the United States faces a wide range of problems. They include the existence of poverty amid tremendous wealth, recurring slumps in the overall economy, disputes over foreign policy, and pollution of the environment. But the American people retain a deep pride in their country and the belief and hope that they can overcome their difficulties as their forefathers did in the past.

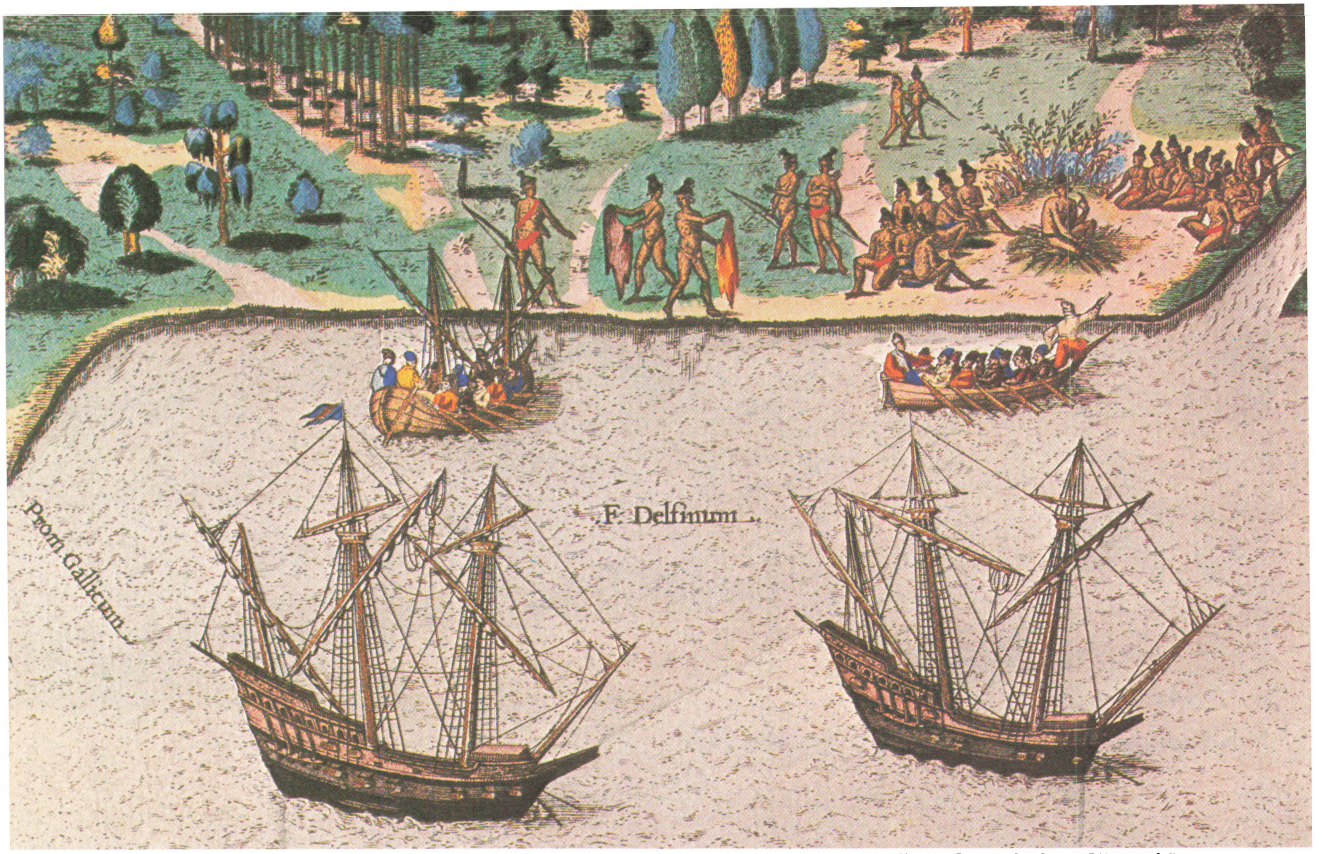
About This Article

The contributor of this article is Oscar Handlin, Carl H. Pforzheimer University Professor at Harvard University. He is the author of many books on American history, including The Uprooted*—a winner of the Pulitzer prize—and* The Americans: A New History of the People of the United States.

The article traces the history of the United States from its beginnings to the present day. The outline below shows the major sections of the article. World Book *also has many individual articles on important events and people in United States history. Cross-references that appear within this article refer the reader to other* World Book *articles for additional details on key topics. The Study Aids section at the end of the article includes a listing of related articles.*

Article Outline:

I. America Before Colonial Times
II. The Colonial Heritage (1607-1753)
III. The Movement for Independence (1754-1783)
IV. Forming a New Nation (1784-1819)
V. Expansion (1820-1849)
VI. The Irrepressible Conflict (1850-1869)
VII. Industrialization and Reform (1870-1916)
VIII. A New Place in the World (1917-1929)
IX. Depression and a World in Conflict (1930-1959)
X. America Since 1960
XI. Study Aids



The French Arrive in Florida (1591), an engraving by Theodore de Bry based on a painting by Jacques le Moyne; Library of Congress

European Explorers from several countries made voyages to America during the 1500's. The scene above shows French explorer Jean Ribaut and his crew approaching the Florida coast in 1562. Friendly Indians gathered along the shore to greet the newcomers.

UNITED STATES HISTORY / *America Before Colonial Times*

For thousands of years, Indians were the only inhabitants of the Western Hemisphere. They had wandered into North America from Asia more than 20,000 years ago. They spread across the hemisphere to the tip of South America. About 10,000 years ago, Eskimos—another Asian people—moved to the Western Hemisphere. But they settled only in the far north, near the Arctic Circle (see ESKIMO).

The Vikings were probably the first white men to reach America. A band of these venturesome seamen is believed to have explored part of the east coast of North America about 1,000 years ago. But European exploration and settlement of America did not begin for another 500 years. Then, in 1492, Christopher Columbus sailed westward from Spain, seeking a short sea route to the Far East, or Orient. He found, instead, a vast New World. Following Columbus' voyage, explorers, soldiers, and settlers from several European countries flocked to America. The process through which white men took control of the Indian homeland was underway.

The First Americans

About 20 million Indians were living in the Americas when Columbus reached the New World. About 15 to 20 million Indians lived between what is now Mexico and the tip of South America. About 1 million Indians lived in what are now the United States and Canada.

The American Indians formed hundreds of tribes, with many different languages and ways of life. Some tribes in the south—including the Aztec, Inca, and Maya—established advanced civilizations. They founded cities that had huge, magnificent buildings. They also accumulated gold, jewels, and other riches. Most American Indians north of Mexico lived in small villages. They hunted game and raised such crops as *maize* (corn), beans, and squash. Some tribes traveled continuously in search of food and never established permanent settlements.

Some Indian tribes of North America helped early European settlers survive in the wilderness of the New World. But as settlers moved westward, they became a threat to the Indian way of life, and Indians and whites became enemies. For a detailed story of the first Americans, see INDIAN, AMERICAN.

European Discovery

The Vikings. About A.D. 1000, Vikings from Greenland explored part of the North American mainland—probably what is now Newfoundland, Canada. Led by Leif Ericson, they were probably the first white men to reach the mainland of the continent. But the Vikings did not establish permanent settlements, and their voyages were soon forgotten.

Columbus. Before Columbus' voyage, Europeans did not know the Western Hemisphere existed. During the 1400's, Europeans became interested in finding a short sea route to the Far East—a region of spices and other valuable goods.

Columbus, an Italian navigator, believed he could find a short route to the East by sailing west. Financed by the Spanish king and queen, he set sail westward from Spain on Aug. 3, 1492. Columbus reached land on October 12, and assumed he had arrived in the Far East. Actually, he landed on San Salvador, one of the islands just east of the North American mainland.

Columbus died in 1506, still believing he had sailed to the Far East. But other Europeans realized he had come upon an unexplored land. They called it the *New World*, and honored Columbus as its discoverer. Europeans also called the Western Hemisphere *America*, after Amerigo Vespucci. An Italian, Vespucci claimed he made voyages to the New World for Spain and Portugal beginning in 1497.

Exploration and Early Settlement

The discovery of the existence of America caused a wave of excitement in Europe. To many Europeans, the New World offered opportunities for wealth, power, and adventure. European rulers and merchants wanted to gain control of the hemisphere's resources in order to add to their wealth. Rulers also sought to gain New World territory, and thus increase their power and importance. Christian clergymen were eager to spread their religion to the Indians. Explorers and others viewed the New World as a place to seek adventure, as well as gain personal fame and fortune. Before long, Europeans from several countries sailed across the Atlantic to explore America and set up trading posts and colonies.

For details on the early exploration, see EXPLORATION AND DISCOVERY.

The Spanish and Portuguese. During the 1500's, the Spanish and Portuguese spread out over the southern part of the Western Hemisphere in search of gold and other riches. The Spaniards quickly conquered the Inca of Peru, the Maya of Central America, and the Aztec of Mexico. The Portuguese took control of what is now Brazil. By 1600, Spain and Portugal controlled most of the hemisphere from Mexico southward.

Also during the 1500's, Spaniards moved into what is now the Southeastern and Western United States. They did not discover riches there, as they did farther south. But they took control of Florida and of the land west of the Mississippi River. In 1565, the Spanish founded St. Augustine, Fla., the oldest city in what is now the United States. They also established missions and other settlements in the West and South. See MISSION LIFE IN AMERICA; SPAIN (The Spanish Empire).

The British and French began exploring eastern North America about 1500. At first, both nations sent only explorers and fur traders to the New World. But after 1600, they began establishing permanent settlements there. The French settlements were chiefly in what is now Canada. The British settlements included the 13 colonies that later became the United States.

For many years, Great Britain and France struggled for control of the land between the Atlantic Ocean and the Mississippi River, and for Canada. Britain finally won out in 1763 when it defeated France in the French and Indian War.

The Land That Became the United States

The explorers who came to the northern part of the hemisphere did not find gold and other riches, as did the Spanish in the south. Nor did these explorers find large Indian civilizations to help supply their needs. Instead, they found a wilderness sparsely inhabited by Indians.

The first settlers encountered many hardships as they attempted to establish colonies along the eastern coast. They had no way of knowing that beyond their settlements lay a vast and unbelievably rich and varied land. But later, the resources of this new land—its fertile soils, abundant water supplies, and plentiful minerals—would help the United States grow into one of the world's largest and most prosperous nations.

Period Facts in Brief

Important Dates

1492 Christopher Columbus sailed from Spain to the Western Hemisphere. Europeans honored him as the discoverer of America.

1497 John Cabot made the first voyage to North America for England.

1500 Portuguese explorer Pedro Álvares Cabral reached what is now Brazil.

1513 Ponce de León of Spain began exploring Florida, seeking the Fountain of Youth.

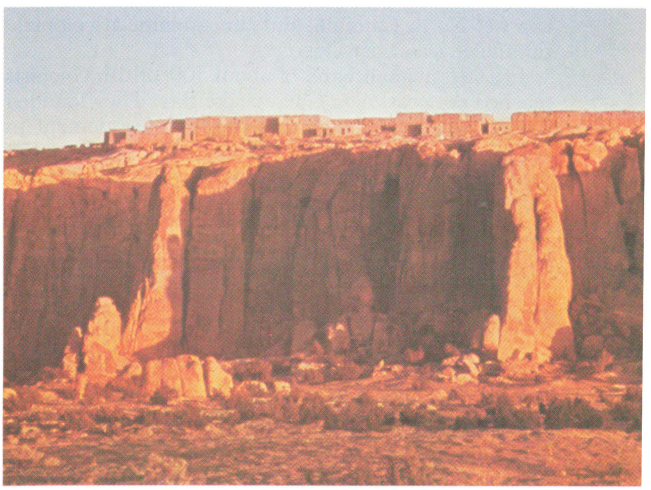
1521 Spanish conquistador Hernando Cortes defeated the Aztec of Mexico.

1534 Jacques Cartier of France became the first European to reach the Gulf of St. Lawrence in Canada.

1540-1542 Francisco Coronado of Spain explored the American Southwest.

1565 Spaniards founded St. Augustine, Fla., the oldest city in what is now the United States.

1585 Sir Walter Raleigh tried unsuccessfully to establish a permanent British settlement in America.



Andreas Feininger, Time-Life Picture Agency © Time, Inc.

An Acoma Indian Village, *above,* is one of the oldest continuously inhabited settlements in the United States. Located on a *mesa* (flat-topped hill) in New Mexico, it probably dates from the 1300's.

Penn's Treaty with the Indians (1771), an oil painting on canvas by Benjamin West; Pennsylvania Academy of the Fine Arts, Philadelphia

Early Colonists worked to maintain good relations with the Indians. William Penn, *arms extended,* made his first treaty with the Indians in 1682. His fair dealings with the Indians helped the colony of Pennsylvania grow and prosper.

UNITED STATES HISTORY: 1607-1753/*The Colonial Heritage*

The first British attempt to establish a colony in what is now the United States took place in 1585. Sir Walter Raleigh sent settlers to Roanoke Island, off the coast of North Carolina. But this attempt at colonization failed (see LOST COLONY).

In 1607, a small band of about 100 British colonists reached the coast near Chesapeake Bay. They founded Jamestown, the first permanent British settlement in North America (see JAMESTOWN). During the next 150 years, a steady stream of colonists came to America and settled near the coast. Most of them were British, but they also included people from France, Germany, Holland, Ireland, and other countries.

The earliest colonists faced great hardship and danger in the wilderness. They suffered from lack of food and from disease, and were sometimes attacked by Indians. But the colonists soon established productive farms and plantations; built towns, roads, churches, and schools; and began many small industries. They prospered economically and, for the most part, maintained peaceful relations with the Indians.

The American colonists also developed political practices and social beliefs that have had a major influence on the history of the United States. They made strides toward democratic government, and they placed a high value on individual freedom and on hard work as a means of getting ahead.

The Thirteen Colonies

In the early 1600's, the British king began granting charters for the purpose of establishing colonies in America. The charters went to companies of merchants and to individuals called *proprietors.* The merchants and proprietors were responsible for recruiting people to settle in America and, at first, for governing them. By the mid-1700's, most of the settlements had been formed into 13 British colonies. Each colony had a governor and legislature, but each was under the ultimate control of the British government.

The 13 colonies stretched from what is now Maine in the north to Georgia in the south. They included the New England Colonies of Massachusetts, Connecticut, Rhode Island, and New Hampshire in the far north; the Middle Colonies of New York, New Jersey, Pennsylvania, and Delaware; Virginia and Maryland along Chesapeake Bay; and the Southern Colonies of North Carolina, South Carolina, and Georgia in the far south.

Virginia and Maryland were among the earliest British colonies. They were founded for different reasons, but they developed in much the same way.

Virginia began with the Jamestown settlement of 1607. The London Company, an organization of English merchants, sent the settlers to America, hoping that they would find gold and other treasures. But the settlers found no treasures, and faced great hardships. Captain John Smith played a leading role in helping the colony survive in its early days. In about 1612, some Jamestown colonists began growing tobacco, which the London Company sold in Europe. The crop soon became popular, and—as tobacco production mounted—Virginia prospered. New farms and settlements sprang up in the colony.

Maryland was founded by the Calverts, a family of wealthy English Roman Catholics. Catholics were persecuted in England, and the Calverts wanted to provide a place where Catholics could enjoy freedom. In 1632, Cecilius Calvert became proprietor of the Maryland area. Colonists, led by Leonard Calvert, established the first Maryland settlement in 1634. The Maryland settlers also raised tobacco. As tobacco production increased, their colony grew and prospered.

The people of Virginia and Maryland made important strides toward democracy and individual liberty. The Virginians appealed to the London Company for a voice in their local government. The company wanted to attract newcomers to its colony, and so it agreed. In 1619, it established the House of Burgesses, the first representative legislature in America (see House of Burgesses). Maryland attracted both Catholic and Protestant settlers. In 1649, the Calverts granted religious freedom to people of both faiths. This was the first religious toleration act in North America.

New England. Puritans, originally financed by English merchants, founded the New England Colonies. Puritans were English Protestants who faced persecution because of their opposition to the Church of England, Britain's official church. See Puritan.

In 1620, a group of *Separatists* (Puritans who had separated from the Church of England) and other colonists settled in New England. Called *Pilgrims*, they founded Plymouth Colony—the second permanent British settlement in North America. Between 1628 and 1630, Puritans founded the Massachusetts Bay Colony at what are now Salem and Boston. Plymouth became part of Massachusetts Colony in 1691. See Plymouth Colony; Massachusetts Bay Colony.

Settlers spreading out from Massachusetts founded the three other colonies in New England. Connecticut was first settled in 1633 and became a colony in 1636. Colonists settled in Rhode Island in 1636. Rhode Island became a colony in 1647. New Hampshire, first settled in 1623, became a colony in 1680.

Important Puritan leaders of the New England Colonies included governors William Bradford of Plymouth and John Winthrop of Massachusetts, and Roger Williams, the founder of Rhode Island.

Life in New England centered around towns. Each family farmed its own plot of land, but they all lived close together in a town. The early New England colonists relied on farming to earn a living. But before long, the New Englanders started many small industries, including fishing, lumber, and crafts.

The Puritans also contributed to democracy in

Period Facts in Brief

First Permanent Settlement, Each Colony

Virginia (1607), Massachusetts (1620), New Hampshire (1623), New York (1624), Connecticut (1633), Maryland (1634), Rhode Island (1636), Delaware (1638), Pennsylvania (1643), North Carolina (about 1653), New Jersey (1660), South Carolina (1670), Georgia (1733).

Important Dates

1607 About 100 colonists founded Jamestown, the first permanent British settlement in North America.
1619 Virginia established the House of Burgesses, the first representative legislature in America.
1620 The Pilgrims founded Plymouth Colony, the second permanent British settlement in North America.
1624 The Dutch established the settlement of New Netherland.
1636 Harvard—the first college in the colonies—was founded.
1638 People from Sweden established the settlement of New Sweden.
1647 Massachusetts established the first colonial public school system.
1649 Maryland passed the first religious toleration act in North America.
1664 England took control of New Netherland and New Sweden.
1672 The Boston Post Road was completed, linking Boston and New York City.
1704 *The Boston News-Letter*, the first successful colonial newspaper, began publication.
1752 Benjamin Franklin flew a homemade kite during a storm to prove that lightning is a form of electricity.

Population Growth and Change

1607
Total population, about 100
Rural, 100%

1753
Total population, 1,328,000
Rural, 98% Urban, 2%

WORLD BOOK map

The Thirteen Colonies stretched along the eastern coast of North America. French territory lay to the north and west of the colonies, and Spanish territory lay to the south.

America. The Pilgrims created the *Mayflower Compact*, an agreement among the adult males to provide "just and equal laws" for all (see MAYFLOWER COMPACT). The New England Puritans also held town meetings, where the adult males worked together to frame laws.

The Middle Colonies. Soon after British settlement started, the Dutch founded New Netherland, a trading post and colony that included what are now New York and northern New Jersey. They began a permanent settlement in New York in 1624, and in New Jersey in 1660. In 1638, the Swedes established a trading post and settlement called New Sweden in present-day Delaware and southern New Jersey. The Dutch claimed New Sweden in 1655. But in 1664, the British—far better established in America than the Dutch—took over New Netherland and New Sweden.

King Charles II of England gave the New York and New Jersey territory to his brother, James, Duke of York. Friends of the duke founded huge farming estates in northern New York. New York City developed from the Dutch city of New Amsterdam in southern New York. It became a shipping and trading center. The Duke of York gave New Jersey to two of his friends who allowed much political and religious freedom. As a result, New Jersey attracted many settlers.

Swedes established a small settlement in what is now Pennsylvania in 1643. In 1681, William Penn of England received a charter that made him proprietor of Pennsylvania. Penn was a *Quaker*—a religious group that was persecuted in many countries (see QUAKERS). At Penn's urging, Quakers and other settlers who sought freedom flocked to Pennsylvania. Penn carefully planned settlements in his colony, and Pennsylvania thrived. Philadelphia, one of the settlements, became the largest city in colonial America. Penn also became proprietor of the Delaware area.

The Southern Colonies. In 1663, King Charles II gave the land between Virginia and Florida, called Carolina, to eight proprietors. Virginians had set up a settlement in the northern part of Carolina about 10 years earlier. After 1663, Carolina attracted British settlers, French Protestants called Huguenots, and Americans from other colonies. In 1712, the northern two-thirds of the region was divided into two colonies, North Carolina and South Carolina. North Carolina developed as a colony of small farms and fur trading activity. In South Carolina, wealthy landowners established rice and indigo plantations. The plantations required many laborers, and landowners filled this need by bringing many blacks to the colony as slaves. The coastal settlement of Charleston, S.C., became a rich seaport and lively social center.

The southern one-third of Carolina remained largely unsettled until 1733. Then, James Oglethorpe of England founded Georgia there. Oglethorpe hoped Georgia would become a colony of small farms. The colony's charter prohibited the importation of blacks so that neither slavery nor plantations would develop. But by 1750, Georgia law had been changed to allow settlers to bring in slaves, and plantations soon developed.

Life in Colonial America

Reports of the economic success and religious and political freedom of the early colonists attracted a steady flow of new settlers. Through immigration and natural growth, the colonial population rose to $1\frac{1}{3}$ million by 1753. Most of the settlers came from Britain, but the colonies also drew newcomers from almost every other country of Western Europe. In addition, the slave trade brought in so many Africans that, by the 1750's, blacks made up about 20 per cent of the population. Yet despite the varied backgrounds of the early settlers, Americans of the mid-1700's had—as one writer said—"melted into a new race of men."

The Colonists. Europeans knew that a person who went to America faced great hardship and danger. But

Detail of *Baltimore in 1752* (about 1807), an aquatint by Daniel Bowley based on a drawing by John Moale; Maryland Historical Society, Baltimore

Many of the Early Settlers grouped together in small villages. Baltimore, Md., *above*, began as a cluster of houses and other buildings along the banks of the Patapsco River. Colonists fished in the river, *left foreground*, and grew tobacco in a large field, *far right*.

Library of Congress

New York Public Library, Arents Collection

The Industrious Colonists worked hard to establish communities in the wilderness. A Northern colonist, *left,* shaves a board to size for a house he is building. Slaves on a Southern plantation, *right,* pack tobacco for shipment to Europe as plantation owners look on.

the New World also offered people the opportunity for a new start in life. As a result, many people were eager to become colonists.

Some Europeans came to America seeking religious freedom. In addition to the Puritans, Roman Catholics, Quakers, and Huguenots, they included Jews and members of German Protestant sects.

Other Europeans became colonists for economic reasons. Some of them were well enough off, but saw America as a place where they could become rich. Many poor Europeans also became colonists. Most of them came to America as *indentured servants.* An indentured servant agreed to work for another person, called a *master*, in America. In return, the master paid for the servant's transportation and provided him with food, clothing, and shelter. Agreements between servants and masters lasted up to seven years, after which the servant was free to work for himself.

Still other people who came to America had no choice in the matter. They included prisoners from overcrowded English jails, Irishmen captured by the English in battle, and black Africans captured in intertribal warfare and sold to European traders. The prisoners and captives were sold into service in America.

At first, the blacks had the same legal status as white indentured servants. But by about 1660, black equality had faded. Many masters began extending the period of service of their black servants indefinitely. This marked the beginning of slavery in North America. Some people in all the American colonies owned slaves, but slavery became more common in the South than in the North. The South had plantations that required large numbers of laborers, and the plantation owners found it profitable to buy slaves to do the work.

The Economy. The earliest colonists had to struggle to produce enough food to stay alive. But before long, colonial America had a thriving economy. Planters grew large crops of rice, indigo, and tobacco. Small farmers raised livestock and such crops as corn and wheat. When not busy in their fields, many farmers fished or hunted. Some cut lumber from forests to provide the materials for such products as barrels and ships. The colonists used part of what they produced, but they exported large quantities of goods. They traded chiefly with Britain, whose manufacturing firms depended on raw materials from its colonies. In return, they received manufactured goods. The colonies also traded with the French, Dutch, and Spanish.

Economic and Social Opportunity. Colonial America, like Europe, had both wealthy upper-class people and poor lower-class people. But in Europe, old traditions made economic and social advancement rare. America had no such traditions. Advancement was possible for everyone willing to work hard except slaves. In the New World, land was plentiful and easy to obtain, and there were many opportunities to start new businesses. Indentured servants often obtained land or worked in a trade after their period of service ended. Often, they or their sons became well-to-do merchants or landowners. The colonies had a great need for professional people, such as clergymen, lawyers, physicians, and schoolteachers. Because little training was required for these jobs, they were open to almost everyone.

The Colonists and Government. The colonists rejected the old idea that government was an institution inherited from the past. Instead, they regarded it as something they themselves had created for their own use. The colonists lived under British rule. But to them, laws made in Britain meant little until they were enforced on the spot. They often ignored British laws. This independent attitude would soon lead to a clash between the Americans and the British.

For more information on life in the American Colonies, see COLONIAL LIFE IN AMERICA.

Detail of *Raising the Liberty Pole*, an engraving by John McRae; Kennedy Galleries, Inc., New York City

Joyful Celebrations followed the signing of the Declaration of Independence on July 4, 1776. The scene above shows colonists raising a liberty pole to mark the occasion. At the right, colonial army officers sign up a volunteer for service in the war for independence against Great Britain.

UNITED STATES HISTORY: 1754-1783 / *The Movement for Independence*

Relations between the American Colonies and Great Britain began to break down during the mid-1700's. Little by little, Britain tightened its control over the colonies. Its leaders passed laws that taxed the colonists and restricted their freedom. The colonists had become accustomed to governing themselves, and had developed a sense of unity and independence. As a result, they deeply resented what they considered British interference in their affairs. Friction between the Americans and British mounted, and, on April 19, 1775, the Revolutionary War broke out between the two sides. During the war—on July 4, 1776—the colonists boldly declared their independence from their mighty British rulers. In 1783, they defeated the British and made their claim to independence stick.

Background to the Revolution

The French and Indian War. Great Britain and France had struggled for control of eastern North America throughout the colonial period. As their settlements moved inland, both nations claimed the vast territory between the Appalachian Mountains and the Mississippi River. The struggle led to the outbreak of the French and Indian War in 1754.

The British won the war, and, under the Treaty of Paris of 1763, Britain gained control of: (1) all of what is now Canada, and (2) all French territory east of the Mississippi River except New Orleans. Britain also received Florida from Spain in 1763. As a result, the British controlled all of North America from the Atlantic Ocean to the Mississippi River.

The French and Indian War was a turning point in American history. It triggered a series of British policy changes that eventually led to the colonial independence movement. See FRENCH AND INDIAN WARS (The French and Indian War).

British Policy Changes. The French and Indian War created problems for the British. After the war, Britain had to find ways to strengthen its control over its enlarged American territory. Also, Britain had spent so much money fighting the French and Indian War that its national debt had nearly doubled. George III, who

had become king of Great Britain in 1760, instructed the British Parliament to establish policies to solve these problems. Parliament soon began passing laws that restricted the freedom of the American colonists, taxed them, or both.

In 1763, Parliament voted to station a standing army in North America to strengthen British control. Two years later, in the Quartering Act, it ruled that colonists must provide British troops with living quarters and supplies. Britain also sought to keep peace in North America by establishing good relations with the Indians. The Indians had already lost a good deal of territory to the white settlers. A British proclamation of October, 1763, prohibited American colonists from settling west of the Appalachian Mountains until treaties with the Indians might open up areas there.

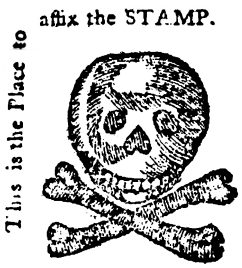
King George and Parliament believed the time had come for the colonists to start obeying trade regulations and paying their share of the cost of maintaining the British Empire. In 1764, Parliament passed the Sugar Act. This law provided for the efficient collection of taxes on molasses brought into the colonies. It also gave British officials the right to search the premises of persons suspected of violating the law. The Stamp Act of 1765 extended to the colonies the traditional English tax on newspapers, legal documents, and other printed matter (see STAMP ACT).

Colonial Reaction. The colonists bitterly opposed the new British policies. They claimed that Britain had no right to restrict their settlement or deny their freedom in any other way. They also strongly opposed British taxes. The colonists were not represented in Parliament. Therefore, they argued, Britain had no right to tax them. The colonists expressed this belief in the slogan, "Taxation Without Representation is Tyranny."

To protest the new laws, colonists organized a widespread boycott of British goods. Many colonists joined secret clubs called *Sons of Liberty*. These groups threatened to use violence to prevent enforcement of the laws (see SONS OF LIBERTY). In 1765, representatives of nine colonies met in the Stamp Act Congress to consider joint action against Britain.

A Brief Easing of Tensions. The colonial boycott and resistance alarmed Britain's leaders. In 1766, Parliament repealed the offensive Stamp Act. But at the same time, it declared that Britain still had the right to make laws for the colonies.

Manuscript Division, New York Public Library



Rare Book Division, New York Public Library; Astor, Lenox, and Tilden Foundation

The Stamp Act, passed by Parliament in 1765, required colonists to buy stamps as a tax on printed matter. A tax stamp appears at the left, *above*. A colonial illustrator drew a skull and crossbones—a symbol of death—*right*, to protest the law.

The Road to Independence

Renewed Conflict. The relaxation of tensions between the Americans and the British proved to be short-lived. In 1767, Parliament passed the Townshend Acts, which taxed lead, paint, paper, and tea imported into the colonies. These and other laws renewed discontent among the colonists. As tensions between the Americans and British grew, Britain reacted by sending troops into Boston and New York City.

The sight of British troops in the city streets aroused colonial anger. On March 5, 1770, Boston civilians taunted a group of troops. The troops fired on the civilians, killing three persons and wounding eight others, two of whom died later. This incident, called the Boston Massacre, shocked Americans and unnerved the British. See BOSTON MASSACRE.

In 1770, Parliament repealed all provisions of the Townshend Acts with one exception—the tax on tea. Three years later, Parliament reduced the tax on tea sold by the East India Company, a British firm. The British actions offended the colonists in two ways. They reaffirmed Britain's right to tax the colonists and gave

Period Facts in Brief

Important Dates

- **1756** A stagecoach line linked New York City and Philadelphia.
- **c. 1757** The first street lights in the colonies were installed in Philadelphia.
- **c. 1760** The first Conestoga wagons were built.
- **1763** Britain defeated France in the French and Indian War and gained control of eastern North America.
- **1763** Britain stationed a standing army in North America and prohibited colonists from settling west of the Appalachian Mountains.
- **1765** The British Parliament passed the Stamp Act, taxing newspapers, legal documents, and other printed matter in the colonies.
- **1766** The first permanent colonial commercial theater opened in Philadelphia.
- **1770** British troops killed American civilians in the Boston Massacre.
- **1773** Colonists staged the Boston Tea Party, dumping British tea into Boston Harbor.
- **1774** The Intolerable Acts closed Boston Harbor and included other steps to punish the colonists.
- **1774** The First Continental Congress met to consider action against the British.
- **1775** The Revolutionary War between the colonists and the British began.
- **1776** The colonists adopted the Declaration of Independence and formed the United States of America.
- **1781** The Americans defeated the British at Yorktown, Va., in the last major battle of the Revolutionary War.
- **1783** The Treaty of Paris officially ended the Revolutionary War.

Population Growth and Change

1754
Total population, 1,360,000
Rural, 98% Urban, 2%

1783
Total population, 3,125,000
Rural, 96% Urban, 4%

the East India Company an unfair advantage in the tea trade. Furious Americans vowed not to use tea and colonial merchants refused to sell it. On Dec. 16, 1773, a group of American colonists staged the Boston Tea Party to dramatize their opposition. Dressed as Indians, the colonists boarded East India Company ships and threw tea the ships contained into Boston Harbor. See BOSTON TEA PARTY.

In 1774—in the Quebec Act—Britain extended the boundary of its colony of Quebec to include territory north of the Ohio River. Quebec had a large French population, and the Americans resented the expansion of the colony. See QUEBEC ACT.

The Intolerable Acts. Angered by the Boston Tea Party, Parliament passed laws to punish the colonists early in 1774. Called the Intolerable Acts by the Americans, the laws included provisions that closed the port of Boston, gave increased power to the British royal governor of the colony of Massachusetts, and required the colonists to house and feed British soldiers. See INTOLERABLE ACTS.

The First Continental Congress. The Intolerable Acts stirred colonial anger more than ever before. On Sept. 5, 1774, delegates from 12 colonies met in the First Continental Congress in Philadelphia. The delegates were responsible men who disliked lawlessness, and they still hoped for a settlement with the British. They reaffirmed American loyalty to Britain and agreed that Parliament had the power to direct colonial foreign affairs. But at the same time, the delegates called for an end to all trade with Great Britain until Parliament repealed the Intolerable Acts. King George shattered hope for reconciliation by insisting that the colonies either submit to British rule or be crushed. See CONTINENTAL CONGRESS.

The Revolutionary War Begins. On April 19, 1775, British troops tried to seize the military supplies of the Massachusetts militia. This action led to the start of the Revolutionary War. Colonists—first at Lexington, and then at Concord, Mass.—took up arms to turn back the British. At Concord, the determined Americans stopped the British advance. Word of their success spread, and hope for victory over Britain grew. Colonial leaders met in the Second Continental Congress on May 10, 1775. The Congress faced the task of preparing the colonies for war. It organized the Continental Army, which colonists from all walks of life joined. On June 15, the Congress named George Washington of Virginia commander in chief of the army.

King George officially declared the colonies in rebellion on Aug. 23, 1775. He warned the Americans to end their rebellion or face certain defeat by Britain. But the threat had no effect on the colonists' determination to fight on. Some of the people—called *Loyalists*—favored submission to British rule, but a growing number of Americans now supported the fight for independence. Many people who had been unsure were convinced by reading Thomas Paine's pamphlet *Common Sense*. Paine—in this brilliant plea for the cause of freedom—stated the simple alternatives open to the Americans: They must either accept the tyranny of the British Crown or throw off their shackles by proclaiming a republic.

The Declaration of Independence. On July 4, 1776, the Second Continental Congress officially declared independence and formed the United States of America by adopting the Declaration of Independence. Written by Thomas Jefferson of Virginia, the declaration was a sweeping indictment of the king, Parliament, and the British people. It also set forth certain self-evident truths that were basic to the revolutionary cause. It said that all men are created equal, and are endowed by their Creator with rights to life, liberty, and the pursuit of happiness. To protect those rights, men organized governments, and the governments derived their powers from the consent of the governed. But

Detail of *The Battle of Lexington, April 19th, 1775* (1775), an engraving by Amos Doolittle; Connecticut Historical Society, Hartford

The Revolutionary War began on April 19, 1775, on the village green in Lexington, Mass., *left*. British troops, *in red coats*, routed the Americans. But later in the day, colonists at nearby Concord stopped a British advance.

when a government ceased to preserve the rights, it was the duty of the people to change the government, or abolish it and form a new one.

Thus the colonists were fighting for philosophical principles as well as specific objectives. The spirit aroused by the Declaration of Independence was an important factor in the ultimate American victory. See DECLARATION OF INDEPENDENCE.

Victory Over a Great Empire. The Americans were challenging the world's most powerful empire in the Revolutionary War. They lacked a well-trained army, officers who were accustomed to commanding troops, and munitions and money. But they had the advantage of fighting on their home territory. The British, on the other hand, had well-trained and well-equipped troops and officers, but they were fighting in an unfamiliar land thousands of miles from home. The American cause was also helped by aid from France and other European nations that opposed Britain.

The Revolutionary War raged on through the 1770's. Then, on Oct. 19, 1781, the Americans won a decisive victory at the Battle of Yorktown in Virginia. The main part of the British Army surrendered there, and the Americans had—in effect—won the war. Two years of peace negotiations and occasional fighting followed. Finally, on Sept. 3, 1783, the Americans and the British signed the Treaty of Paris of 1783, officially ending the Revolutionary War.

For a detailed account of the war for independence, see REVOLUTIONARY WAR IN AMERICA.

American Attitudes and Independence

Through the years, the American people had developed attitudes that help explain their strong desire to gain freedom from the British. These attitudes included a deep belief in government by the people, a sense of unity, an optimistic view of the future, and strong nationalistic feelings.

Government by the People. When the American colonies were first settled, merchants and large landowners held most of the political power. But little by little, other colonists began to use the political process to express their views on important issues. Such issues included the ownership of land, representation in government, taxation, and the role of the church in society. The colonists learned to back candidates for public office who would represent their views and challenge the power of the ruling class.

The ruling merchants and landowners presented only half-hearted resistance to this widening of political power. They needed the aid of the lower classes to back their opposition to British policy. Furthermore, the very argument for self-government that the colonial leaders used against the British justified those seeking to share political power within the colonies. By 1774, America no longer was a society in which the few ruled with the passive consent of the many. Instead, large numbers of people had an active voice in government.

Unity, Optimism, and Nationalism. Through the years, the colonists had developed feelings of unity. Their opposition to the British led them to rely on one another more and more. Groups called *Committees of Correspondence* were set up throughout the colonies to provide organized opposition to Britain. Supported voluntarily by the people, the committees decided what action should be taken against the British in times of crisis. See COMMITTEES OF CORRESPONDENCE.

The colonial Americans also shared an optimistic view of their future. They were impressed by the rapid growth of their colonies, and they loved to calculate how much more their population and wealth would yet increase.

Unity and progress led to an increasing sense of nationalism among the people. By 1774, the colonists no longer thought of themselves as transplanted Europeans, but rather as Americans.

Congress Voting Independence (1785), an oil painting on canvas by Robert Edge Pine and Edward Savage; Historical Society of Pennsylvania, Philadelphia

The Vote for Independence from Great Britain took place on July 2, 1776. On July 4, the Second Continental Congress officially adopted the Declaration of Independence, and the United States of America was born.

Election Day at the State House (1816), India ink and water color on paper by John Lewis Krimmel; Historical Society of Pennsylvania, Philadelphia

Democratic Elections were among the important features written into the new nation's Constitution by the Founding Fathers. Large numbers of voters, *above*, turned out in Philadelphia for an election in 1816. American flags waving in the breeze added to the patriotic spirit of the event.

UNITED STATES HISTORY: 1784-1819 / *Forming a New Nation*

As a result of the Treaty of Paris of 1783, the new nation controlled all of North America from the Atlantic Ocean to the Mississippi River between Canada and Florida. Canada, to the north, remained British territory. Great Britain returned Florida to Spain, and Spain continued to control the area west of the Mississippi River.

The original 13 colonies made up the first 13 states of the United States. Eventually, the American land west of the Appalachian Mountains was divided into territories.

At the end of the Revolutionary War, the new nation was still a loose confederation of states. But in 1787, American leaders got together and wrote the Constitution of the United States. The Constitution became the country's basic law and welded it together into a solid political unit. The men who wrote it included some of the most famous and important figures in American history. Among them were George Washington and James Madison of Virginia, Alexander Hamilton of New York, and Benjamin Franklin of Pennsylvania. The authors of the Constitution, along with other early leaders such as Thomas Jefferson of Virginia, won lasting fame as the Founding Fathers of the United States.

At the start of its history, the United States faced severe financial problems. But before long, the skill of its leaders and the spirit and hard work of its people put the country on a sound economic footing. Early America also faced threats from powerful European nations. But masterful diplomacy by Washington and other leaders guided the country through its early years in peace. The peace ended with the War of 1812, in which the United States and Great Britain fought to a standstill. After the war, America focused its attention on its own development, and entered a period of bustling economic growth.

Establishing a Government

The American people began setting up a new system of government as soon as they declared their independence. Each of the new states had its own constitution before the Revolutionary War ended. The state constitutions gave the people certain liberties, usually including freedom of speech, religion, and the press. In 1781, the states set up a federal government under laws called the Articles of Confederation. But the Articles proved to be inadequate for running the government. The shortcomings of the Articles led to the formation of a new government under the Constitution.

Background to the Constitution. The Articles of Confederation gave the federal government the power to declare war and manage foreign affairs. But the Articles did not allow the government to collect taxes, regulate trade, or otherwise direct the activities of the states.

Under the Articles, each state worked independently for its own ends. Yet the new nation faced problems that demanded a strong federal government. The United States had piled up a huge national debt during the Revolutionary War. But since the federal government could not collect taxes, it was unable to pay the debt and put the country on a sound economic footing. The government even lacked the means for raising money to provide for national defense. The federal government had no power to regulate the nation's trade. In addition, some states issued their own paper money, causing sharp changes in the value of currency and economic chaos. See ARTICLES OF CONFEDERATION.

Creating the Constitution. In 1786, Virginia persuaded five states to send delegates to a convention at Annapolis, Md., to discuss interstate commerce. The delegates decided that the Articles of Confederation would have to be revised and wrote a report calling for all states to join in a new convention. In 1787, delegates from every state except Rhode Island met in Philadelphia's Independence Hall to consider revisions to the Articles. Rhode Island did not take part because it resented "outside interference" in its affairs. The delegates decided against simply revising the Articles of Confederation. Instead, they agreed to write an entirely new Constitution. The convention chose George Washington as presiding officer.

The delegates debated long and hard over the contents of the Constitution. Some of them wanted a document that gave much power to the federal government. Others wanted to protect the rights of the states and called for a weak central government. Delegates from large states claimed their states should have greater representation in Congress than the small states. But small-state delegates demanded equal representation.

The delegates finally reached agreement on a new Constitution on Sept. 17, 1787. The document they produced has often been called a work of political genius. The authors skillfully worked out a system of government that satisfied the opposing views of the people of the 1780's. At the same time, they created a system of government flexible enough to continue in its basic form to the present day.

The Constitution provided for a two-house legislature—a House of Representatives and a Senate. Representation in the House was based on population in order to satisfy the large states. All states received equal representation in the Senate, which pleased the small states. The Constitution gave many powers to the federal government, including the rights to collect taxes and regulate trade. But it also reserved powers for the states. The Constitution provided for three branches of government: the executive, headed by a President; the legislature, made up of the two houses of Congress; and the judiciary, or federal court system. In a master stroke of government organization, the creators of the Constitution provided for a system of checks and balances among the three branches. Each branch received powers and duties that ensured that the other branches would not have too much power.

Adopting the Constitution. Before the Constitution became law, it needed *ratification* (approval) by nine states. Some Americans still opposed the Constitution,

Period Facts in Brief

Presidents (with political parties and dates of service)

George Washington, no political party, 1789-1797
John Adams, Federalist, 1797-1801
Thomas Jefferson, Democratic-Republican, 1801-1809
James Madison, Democratic-Republican, 1809-1817
James Monroe, Democratic-Republican, 1817-1825

States in the Union

The 13 states that ratified the Constitution:
Delaware (1787), Pennsylvania (1787), New Jersey (1787), Georgia (1788), Connecticut (1788), Massachusetts (1788), Maryland (1788), South Carolina (1788), New Hampshire (1788), Virginia (1788), New York (1788), North Carolina (1789), Rhode Island (1790).

New states added through 1819:
Vermont (1791), Kentucky (1792), Tennessee (1796), Ohio (1803), Louisiana (1812), Indiana (1816), Mississippi (1817), Illinois (1818), Alabama (1819).

Important Dates

1787 The Founding Fathers wrote the Constitution.
1790's The first U.S. political parties developed.
1790 Samuel Slater built the country's first successful water-powered machines for spinning cotton.
1793 Eli Whitney invented the cotton gin.
1800 Washington, D.C., became the national capital.
1803 The Louisiana Purchase doubled the size of the United States.
1811 Work began on the National Road, which—when completed—linked the East and the Midwest.
1812-1814 The United States and Great Britain fought the War of 1812.
1814 Francis Scott Key wrote "The Star-Spangled Banner."

Population Growth and Change

1784
Total population, 3,240,000
Rural, 96% Urban, 4%

1819
Total population, 9,358,000
Rural, 93% Urban, 7%

WORLD BOOK map

The United States After the Revolution extended from the Atlantic Ocean to the Mississippi River. British territory lay to the north, and Spanish territory lay to the west and south.

and fierce debate over ratification broke out. Hamilton, Madison, and John Jay responded to criticism of the document in a series of letters to newspapers. Called *The Federalist*, the letters gained much support for the Constitution (see FEDERALIST, THE). On June 21, 1788, New Hampshire became the ninth state to ratify.

The Bill of Rights. Much opposition to the new Constitution stemmed from the fact that it did not specifically guarantee enough individual rights. In response, 10 amendments known as the Bill of Rights were added to the document. The Bill of Rights became law on Dec. 15, 1791. Among other things, it guaranteed freedom of speech, religion, the press, and the rights to trial by jury and peaceful assembly.

For more details, see CONSTITUTION OF THE UNITED STATES; BILL OF RIGHTS.

Setting Up the Government. The Constitution provided that the President be elected by an Electoral College, a group of men chosen by the states (see ELECTORAL COLLEGE). In 1789, the Electoral College unanimously chose Washington to serve as the first President. It re-elected him unanimously in 1792. The people elected the members of the first House of Representatives, as they do today. But the senators were chosen by the state legislatures, a practice that continued until the early 1900's. The government went into operation in 1789, with its temporary capital in New York City. The capital was moved to Philadelphia in 1790, and to Washington, D.C., in 1800.

Early Problems and Politics

Solving Financial Problems. Financial problems plagued the new government. The national debt piled up during the Revolutionary War threatened the financial structure of the United States. The nation also needed internal improvements such as roads and bridges, but the federal government could not afford to pay for them.

Americans split over how to deal with the financial problems. One group, led by Secretary of the Treasury Alexander Hamilton, wanted the federal government to take vigorous action. Another group, headed by Secretary of State Thomas Jefferson, opposed government participation in economic affairs.

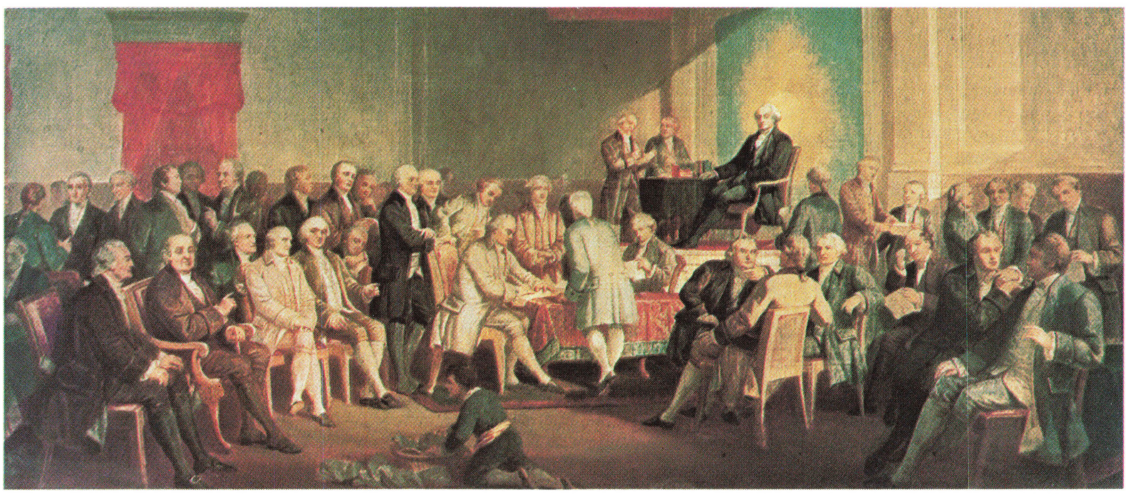
Hamilton proposed that the government increase tariffs and tax certain products made in the United States, such as liquor. The government would use the tax money to pay both its debts and those of the states. It would also have money for ongoing expenses and internal improvements. Hamilton also proposed a government-supported national bank to control government finances.

Jefferson and his followers, who included many Southerners, denounced all of Hamilton's plans. But Jefferson later agreed to support some of Hamilton's financial proposals. In return, Hamilton agreed to support a shift of the national capital to the South. Congress approved Hamilton's financial plan and agreed to locate the capital in the South. Jefferson continued to oppose the national bank proposal. But in 1791, Congress chartered a national bank for 20 years (see BANK OF THE UNITED STATES).

Enforcing Federal Law. The new tax program led to the Whiskey Rebellion. In 1794, farmers in Pennsylvania who made whiskey refused to pay the tax on liquor. President Washington sent in troops who ended the rebellion. Washington's action did much to establish the federal government's authority to enforce its laws within the states. See WHISKEY REBELLION.

Foreign Affairs. The new government also faced problems in foreign affairs. In 1793, France went to war against Britain and Spain. France had helped the Americans in the Revolutionary War, and it now expected U.S. assistance in its war. Americans disagreed over which side to support. Jefferson and his followers wanted the United States to back France, while Hamilton and his group favored the British.

President Washington insisted that the United States



Signing the Constitution (1860's), an oil painting on canvas by Thomas Rossiter; Independence National Historical Park Collection, Philadelphia

The Signing of the Constitution, *above,* ranks among the most historic events in American history. The delegates to the Constitutional Convention signed the document in 1787. Ratified in 1788, the Constitution has served as the basic law of the United States ever since.

remain neutral in the European war. He rejected French demands for support, and also sent diplomats to Britain and Spain to clear up problems with those countries. Chief Justice John Jay, acting for Washington, negotiated the Jay Treaty with Britain in 1794. The treaty's many provisions included a trade agreement with Britain which—in effect—ended American trade with France. It also included a British promise to remove troops still stationed on U.S. territory. In 1795, Thomas Pinckney negotiated the Pinckney Treaty, or Treaty of San Lorenzo, with Spain. This treaty settled a dispute over the Florida border between the United States and Spain and also gave the United States free use of the Mississippi River. See JAY TREATY; PINCKNEY TREATY.

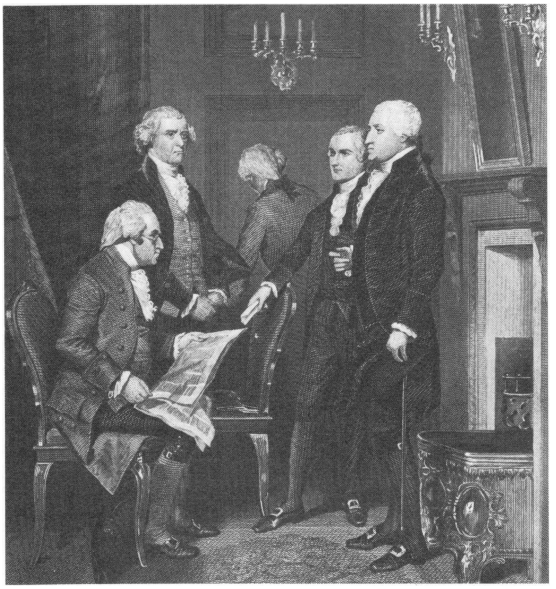
In 1796, Washington—annoyed by the disputes within his Administration—refused to seek a third term as President. John Adams succeeded him in 1797. At about that time, French warships began attacking American merchant vessels. Adams, like Washington, hoped to use diplomacy to solve foreign problems. He sent diplomats to France to try to end the attacks. But three agents of the French government insulted the diplomats with dishonorable proposals, including a demand for a bribe. The identity of the agents was not revealed. They were simply called *X*, *Y*, and *Z*, and the incident became known as the XYZ Affair.

The XYZ Affair created a furor in the United States. Hamilton and his followers demanded war against France. But Adams was determined to keep the peace. In 1799, he again sent diplomats to France. This time, the United States and France reached a peaceful settlement. See XYZ AFFAIR.

Establishing Political Parties. Washington and many other early American leaders opposed political parties. But in the 1790's, the disputes over government policies led to the establishment of two parties. Hamilton and his followers, chiefly Northerners, formed the Federalist Party. The party favored a strong federal government and generally backed Britain in international disputes. Jefferson and his followers, chiefly Southerners, established the Democratic-Republican Party. The party wanted a weak central government and generally sided with France in foreign disputes. See FEDERALIST PARTY; DEMOCRATIC-REPUBLICAN PARTY.

The Alien and Sedition Acts. The XYZ Affair had a major impact on American internal policies and politics. After the affair, the Federalists denounced the Democratic-Republicans for their support of France. The Federalists had a majority in Congress. They set out to silence their critics, who included Democratic-Republicans and foreigners living in the United States. In 1798, the Federalist Congress and President Adams —also a Federalist—approved the Alien and Sedition Acts. These laws made it a crime for anyone to criticize the President or Congress, and subjected foreigners to unequal treatment.

A nationwide outcry against these attacks on freedom followed. The protests included the Kentucky and Virginia Resolutions. The resolutions were statements by the Kentucky and Virginia state legislatures that challenged the constitutionality of the Alien and Sedition Acts. The most offensive parts of the Acts soon expired or were repealed. However, the laws gave the Federalists the reputation as a party of oppression. See ALIEN AND SEDITION ACTS; KENTUCKY AND VIRGINIA RESOLUTIONS.



Chicago Historical Society

George Washington, *far right,* **became the first American President in 1789. The other men in the picture are the members of his first Cabinet. They are,** *left to right,* **Henry Knox, Thomas Jefferson, Edmund Randolph, and Alexander Hamilton.**

Jeffersonian Democracy

Public reaction to the Alien and Sedition Acts helped Jefferson win election as President in 1800 and again in 1804. Jefferson's political philosophy became known as *Jeffersonian Democracy.* It called for as little government as possible. Jefferson envisioned the United States as a nation of small farmers. In Jefferson's ideal society, the people would lead simple, but productive, lives and be able to direct their own affairs. Therefore, the need for government would decline. Jefferson took steps to reduce government expenses and the national debt. But in spite of his beliefs and practices, Jefferson found that as President he could not avoid actions that expanded the role of government.

The Louisiana Purchase, the first major action of Jefferson's presidency, doubled the size of the United States. In 1801, Jefferson learned that France had taken over from Spain a large area between the Mississippi River and the Rocky Mountains called Louisiana. Spain was a weak nation, and did not pose a threat to the United States. But France—then ruled by Napoleon Bonaparte—was powerful and aggressive. Jefferson viewed French control of Louisiana as a danger to the United States.

In 1803, Jefferson arranged the purchase of the area from France for about $15 million. The Constitution did not authorize the government to buy foreign territory. Jefferson, a defender of strict interpretation of the Constitution, had to admit that he had "stretched the Constitution until it cracked."

WORLD BOOK map

The Louisiana Purchase of 1803 added to the United States the territory between the Mississippi River and the Rocky Mountains. The purchase doubled the size of the country.

The Louisiana Purchase added 827,987 square miles (2,144,476 square kilometers) of territory to the United States. In 1804, Jefferson sent Meriwether Lewis and William Clark to explore the land. Lewis and Clark traveled all the way to the Pacific Ocean. Their reports provided valuable information about the Indians and the natural wealth of the West. See LOUISIANA PURCHASE; LEWIS AND CLARK EXPEDITION.

The Supreme Court. John Marshall became chief justice of the United States in 1801. Under Marshall, the Supreme Court became a leading force in American society. In 1803, in the case of *Marbury v. Madison*, the court asserted its right to rule on the constitutionality of federal legislation (see MARBURY V. MADISON). From then until Marshall's death in 1835, the court reviewed about 50 cases involving constitutional issues. This role of Marshall's court strengthened the nation by providing a way to ensure that government remained within constitutional bounds. But the Supreme Court also did much to increase the power of the federal government, a development Jefferson had opposed. For example, in *McCulloch v. Maryland* (1819), the court ruled that the federal government has implied powers in addition to those specified in the Constitution. It also said federal authority prevails over state authority when the two conflict (see MCCULLOCH V. MARYLAND).

Jefferson and Foreign Policy. In 1803, Great Britain and France went to war again, and both nations began seizing American merchant ships. The British also *impressed* American seamen, seizing them and forcing them into British service.

Jefferson again found it necessary to use government powers, this time to protect American shipping. At his request, Congress passed trade laws designed to end British and French interference. The Embargo Act of 1807 made it illegal for Americans to export goods to foreign countries. But the embargo threatened to ruin the nation's economy, and was repealed in 1809. The Non-Intercourse Act of 1809 prohibited Americans from trading with Britain and France. But the warring nations still interfered with American trade.

The War of 1812

James Madison succeeded Jefferson as President in 1809. France soon promised to end its interference with American shipping, but Britain did not. Also, people believed the British were encouraging Indians to attack American pioneers moving westward. For these reasons, many Americans demanded war against Britain. They were led by members of Congress from the West and South called *War Hawks*, including Henry Clay of Kentucky and John C. Calhoun of South Carolina. Other Americans, especially New Englanders, opposed the War Hawks' demand. But on June 18, 1812, at Madison's request, Congress declared war on Britain and the War of 1812 had begun.

Neither side gained much advantage early in the war. But on Aug. 24, 1814, British troops captured Washington, D.C., and burned the Capitol and other government buildings. This British action made Americans

Capture of the City of Washington (1815), an anonymous engraving; Anne S. K. Brown Military Collection, Brown University Library, Providence, R.I.

British Troops captured Washington, D.C., in 1814—during the War of 1812. The British set fire to the United States Capitol, the White House, and other government buildings in the city.

realize their nation's survival was at stake. Large numbers of volunteers rushed into service, and helped stop the British offensive. The Treaty of Ghent of Dec. 24, 1814, officially ended the War of 1812. Neither side won the war and little was gained from the struggle. See WAR OF 1812.

Growing Nationalism

A strong spirit of nationalism swept through the United States following the War of 1812. The war itself gave rise to increased feelings of self-confidence and unity. The peace that followed enabled the nation to concentrate on its own affairs. The bitterness that had marked political disputes eased with the break-up of the Federalist Party. Meanwhile, the nation expanded westward, new states entered the union, and the economy prospered. Historians sometimes call the period from about 1815 to the early 1820's *The Era of Good Feeling* because of its relative peace, unity, and optimism about the future.

Nationalism and the Economy. After the War of 1812, Henry Clay and other nationalists proposed economic measures that came to be called the *American System*. They said the government should raise tariffs to protect American manufacturers and farmers from foreign competition. Industry would then grow and employ more people. More employment would lead to greater consumption of farm products, and so farmers would prosper and buy more manufactured goods. In addition, tariff revenues would enable the government to make needed internal improvements.

The government soon put ideas of the American System into practice. In 1816, Congress enacted a high tariff, and it rechartered the national bank to give the government more control over the economy. The government also increased its funding of internal projects. The most important funding increase was for the National Road, the building of which had begun in 1811. The road—when completed—stretched from Cumberland, Md., to Vandalia, Ill. It became an important route for the shipment of goods and the movement of settlers westward (see NATIONAL ROAD).

A National Culture. Many early Americans had tried to pattern their culture after European civilization. Architects, painters, and writers tended to imitate European models. But in the late 1700's and early 1800's, art and culture more and more reflected American experiences. Architects designed simple, but beautiful, houses that blended into their surroundings. Craftsmen built sturdy furniture that was suited to frontier life, yet so simply elegant as to be considered works of art. The furniture of the Shakers, a religious group, is an example. The nation's literature flourished when it began reflecting American experiences. Political writings such as the works of Thomas Paine and the authors of *The Federalist* had high literary merit. The works of Washington Irving, one of the leading early authors, included tales based on American folklore.

Decline of the Federalists. In 1814 and 1815, New England Federalists held a secret political meeting in Hartford, Conn. Their opponents charged that they had discussed the *secession* (withdrawal) of the New England States from the Union (see HARTFORD CONVENTION). The Federalists never recovered from the charge, and the party broke up about 1816. James Monroe, the Democratic-Republican presidential candidate in the election of 1820, was unopposed.

New Territory. The United States gained two new pieces of territory between 1815 and 1820. In 1818, a treaty with Britain gave the country the Red River Basin, north of the Louisiana Territory. Spain ceded Florida to the United States in 1819.

"A Fire Bell in the Night." The Era of Good Feeling did not mean an end to all the country's disputes. The issue of slavery was causing deep divisions among the people. Many Northerners were demanding an end to slavery, while Southerners were defending it more and more. Jefferson, then retired, accurately viewed the growing dispute as a warning of approaching disaster, "like a fire bell in the night."

Detail of *Fairview Inn* (1889), a water color on paper by Thomas C. Ruckle; Maryland Historical Society, Baltimore

The National Road was one of the major transportation routes in early America. When completed, it stretched from Maryland to Illinois. A steady stream of pioneers moved westward along the road. Inns, like the one above, provided resting and eating stops for travelers.

Prairie Scene: Mirage (1837), a water color by Alfred Jacob Miller; Walters Art Gallery, Baltimore

Americans Moved Westward by the thousands during the early 1800's. Hardy pioneers, *above*, piled all their belongings into covered wagons and set out to find new homes in the West. The push westward continued until the nation stretched from coast to coast.

UNITED STATES HISTORY: 1820-1849/*Expansion*

During the early 1800's, settlers by the thousands moved westward over the Appalachian Mountains into the new states and territories. Many of these pioneers even settled beyond the country's western boundary. They flocked into Texas, California, and other western lands belonging to Mexico. Americans also settled in the Oregon Country, a large territory between California and Alaska claimed by both Britain and the United States. In the mid-1800's, the United States gained control of the Mexican lands and the southern part of the Oregon Country, and the nation extended from coast to coast.

The pioneers were brave, hardy people who went west in search of a better life. They were attracted by the West's open land, good farmland, and rich mineral and forest resources. Through hard work, they settled the Western wilderness—as earlier Americans had done in the East.

The build-up of the West gave rise to changes in American politics. As areas in the West gained large populations, they were admitted to the Union as states. But wealthy Easterners continued to control governmental and economic policy. Western farmers and frontiersmen, as well as city laborers and craftsmen, soon banded together politically to promote their interests. They found a strong leader in Andrew Jackson, and helped elect him President in 1828. Jackson took steps to reduce the power of wealthy Easterners and aid the "common man." At the same time, other Americans were working for such reforms as women's rights, improvements in education, and the abolition of slavery.

The United States and Europe maintained peaceful relations during the Expansion Era. But in 1823, President James Monroe issued the Monroe Doctrine, a statement that warned European countries not to interfere with any of the free nations of the Western Hemisphere (see MONROE DOCTRINE).

America Moves West

By 1820, American pioneers had established many frontier settlements as far west as the Mississippi River. By the 1830's, the Westward Movement had pushed the frontier across the Mississippi, into Iowa, Missouri, Arkansas, and eastern Texas. The land beyond, called the *Great Plains*, was dry and treeless, and seemed to be poor farmland. But explorers, traders, and others who had journeyed farther west told of rich farmland and forests beyond the Rocky Mountains. In the 1840's, large numbers of pioneers made the long journey across the Great Plains to the Far West.

The Pioneers included Easterners from both the North and South. Many other pioneers came from Europe seeking a better life. Some people went west in search of religious freedom. The best known of these were the Mormons, who settled in Utah in 1847.

Most of the pioneers became farmers who owned their own plots. But urban life also moved westward with the frontier. Bustling towns and cities grew up in the West. There, traders in farm goods and other products of the West carried on brisk businesses. The urban

centers also attracted churches, banks, stores, and hotels; and clergymen, craftsmen, doctors, lawyers, lawmen, and schoolteachers.

For more details on the pioneers, see PIONEER LIFE IN AMERICA; WESTWARD MOVEMENT.

Manifest Destiny. By the mid-1840's, thousands of Americans lived in the Oregon Country and on the western land claimed by Mexico. By then, large numbers of Americans had come to believe in the doctrine of *manifest destiny*. That is, they thought the United States should control all of North America. Stirred by this belief, Americans demanded control of Oregon and the Mexican territory.

The conflicting claim with Britain over Oregon was settled with relative ease. Britain decided that the effort needed to hold all of Oregon was not worth while. In 1846, the British turned over to the United States the part of the territory south of the 49th parallel, except Vancouver Island. See OREGON TERRITORY.

The struggle over the Mexican territory was more complicated. It began in Texas in 1835, when the American settlers there staged a successful revolt against Mexican rule. In 1836, the settlers proclaimed Texas an independent republic, but also requested U.S. statehood. Nine years later, the United States annexed Texas and made it a state.

The United States gained more Mexican territory as a result of the Mexican War. In 1846, President James K. Polk sent General Zachary Taylor to occupy land near the Rio Grande that both the United States and Mexico claimed. Fighting broke out between Taylor's troops and Mexican soldiers. On May 13, 1846, at Polk's request, Congress declared war on Mexico. The United States quickly defeated its weak neighbor. The Treaty of Guadalupe Hidalgo, signed on Feb. 2, 1848, officially ended the war. The treaty gave the United States a vast stretch of land from Texas west to the Pacific and north to Oregon.

In 1853, in the Gadsden Purchase, America bought

Period Facts in Brief

Presidents (with political parties and dates of service)

James Monroe, Democratic-Republican, 1817-1825
John Quincy Adams, Democratic-Republican, 1825-1829
Andrew Jackson, Democrat, 1829-1837
Martin Van Buren, Democrat, 1837-1841
William H. Harrison, Whig, 1841
John Tyler, Whig, 1841-1845
James K. Polk, Democrat, 1845-1849
Zachary Taylor, Whig, 1849-1850

States in the Union

Number at start of period: 22
Number at end of period: 30
States added during the period:
Maine (1820), Missouri (1821), Arkansas (1836), Michigan (1837), Florida (1845), Texas (1845), Iowa (1846), Wisconsin (1848).

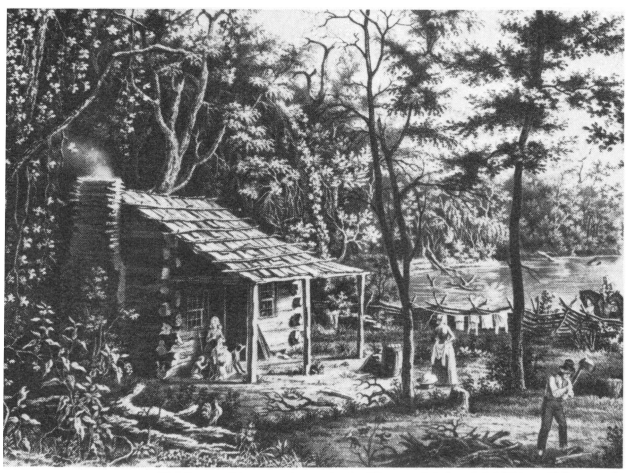
Important Dates

1820 The Missouri Compromise ended a slavery dispute.
1823 The Monroe Doctrine warned Europeans against interference in Western Hemisphere affairs.
1825 The Erie Canal opened, providing a water route from the Atlantic Ocean to the Great Lakes.
1830 The *Tom Thumb*, the nation's first commercial steam locomotive, operated in Baltimore.
1832 South Carolina threatened secession over a tariff.
1834 Cyrus McCormick patented the reaper.
1837 Samuel F. B. Morse demonstrated the first successful telegraph in the United States.
1846 Britain ceded the southern part of the Oregon Country to the United States.
1848 Victory in the Mexican War gave the United States vast new territory in the West.
1848 The discovery of gold in California triggered the Gold Rush.

Population Growth and Change

1820
Total population, 9,638,453
Rural, 93% Urban, 7%

1849
Total population, 22,488,000
Rural, 85% Urban, 15%



Settlement of Immigrants in Missouri (about 1850), a lithograph by E. Sachse; Missouri Historical Society, St. Louis

A Pioneer Homestead in Missouri, *above*, consisted of a log cabin and a small piece of farmland. The farmer cleared timber from the surrounding forest to build his house and to burn as fuel.

WORLD BOOK map

Expansion in the Mid-1800's extended the nation westward to the Pacific Ocean. The Oregon Country was ceded to the U.S. by Britain. The rest of the new territory came from Mexico.

Detail of *The Trail of Tears* (1942), an oil painting on canvas by Robert Lindneux; Woolaroc Museum, Bartlesville, Okla.

Eastern Indians were forced to move west of the Mississippi River during the Expansion Era as whites took over their land. The difficult journey, above, became known as the *Trail of Tears* among the Cherokee and Choctaw Indians.

from Mexico the strip of land that makes up the southern edge of Arizona and New Mexico. The United States then owned all the territory of its present states except Alaska (purchased from Russia in 1867) and Hawaii (annexed in 1898). See MEXICAN WAR; GADSDEN PURCHASE.

The western territory gained by the United States added to the American spirit of national pride and was a key factor in the nation's economic growth. But it also helped widen the split between the North and South, and helped bring on the Civil War. See *The Irrepressible Conflict* section of this article.

Expansion and the Indians. As the pioneers moved westward, they took over much of the land that Indians had occupied for thousands of years. Fighting often broke out between the pioneers and Indians. The United States government sent soldiers to battle the Indians and the soldiers won most of these so-called Indian Wars. By the 1840's, the soldiers had driven most eastern Indians west of the Mississippi River. See INDIAN WARS (Along the Frontier).

Expansion and the Economy. Expansion into the rich interior of the continent enabled the United States to become the world's leading agricultural nation. Many of the pioneer farmers found they could produce more than they needed for their families. They then concentrated on products with high sales value. Cotton was in great demand by textile mills in Europe and the Eastern United States. Farmers in the South as far west as Texas raised cotton to supply the mills. Many settlers in Kentucky and Tennessee prospered by growing tobacco. Midwesterners produced large crops of corn and wheat, and also raised much livestock. Farmers in the Far West raised wheat, fruit, and other valuable products.

New techniques and machines boosted the output of America's farms. The cotton gin, invented by Eli Whitney in 1793, came into widespread use in the 1800's. It enabled cotton growers to separate cotton fiber from the seeds as fast as 50 people could by hand. The reaper, patented by Cyrus McCormick in 1834, allowed farmers to harvest grain much more quickly than before. See COTTON GIN; REAPING MACHINE.

The discovery of minerals in the West also aided America's economy. The most famous mineral strike took place in 1848, when gold was discovered at Sutter's Mill in California. See FORTY-NINER; GOLD RUSH.

The period also marked the beginning of large-scale manufacturing in the United States. Previously, most manufacturing was done by craftsmen at home or in small shops. But beginning in the early 1800's, businessmen erected factories equipped with modern machinery that enabled them to produce goods more rapidly. Manufacturing remained centered in the East, but some Western towns developed industries.

Developments in transportation also contributed immensely to America's economic growth. New or improved roads—such as the National Road in the East and the Oregon and Santa Fe trails in the West—eased the difficulty of traveling and shipping goods by land (see TRAILS OF EARLY DAYS with its *Related Articles*).

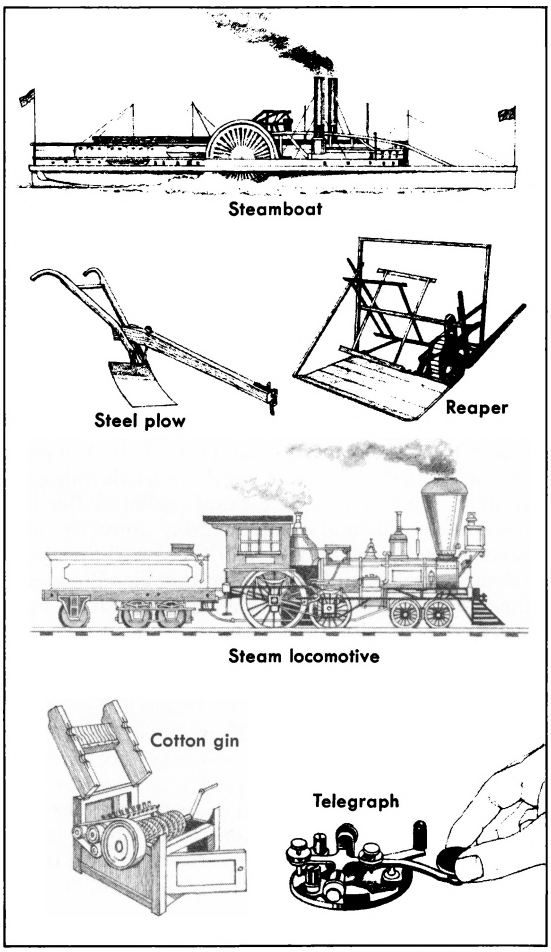
In 1807, Robert Fulton demonstrated the first commercially successful steamboat, the *Clermont*. The steamboat soon became the fastest and most important means

Detail of *A Cotton Plantation on the Mississippi* (1884), a Currier and Ives lithograph based on a painting by W. A. Walker; Museum of the City of New York

Cotton Plantations sprang up throughout the South in the 1800's. Cotton became so important to the Southern economy that people called the crop "King Cotton." Many whites used black slaves to work in their fields. They claimed that slave labor was vital to the South's economy.

The Camden and Amboy Railroad with the Engine "Planet" in 1834 (1904), an oil painting on canvas by Edward Lamson Henry; Graham Gallery, New York City

Railroads and Steamboats became important means of transportation during the Expansion Era. In the scene above, New Jersey travelers transfer from a steamboat, *background,* to a train. A stagecoach and a carriage—two other means of transportation—appear at the right.



WORLD BOOK Illustrations by David Cunningham

Technological Advances in transportation, farming, and communication greatly aided America's economic growth during the early 1800's. Some of the developments are shown above.

of shipping goods. Americans of the early 1800's built many canals to connect their natural waterways. The Erie Canal, the most important one, was completed in 1825. It opened a water passage from the Hudson River in New York to the Great Lakes in the Midwest. Boats used the canal to carry manufactured products from the East to the West and farm products and raw materials from the West to the East (see ERIE CANAL).

The steam-powered railroad soon rivaled the steamboat in importance as a means of shipping. In the 1820's, American railroads were still in the experimental stage. But by 1850, about 9,000 miles (14,500 kilometers) of railroad lines were in operation.

In 1837, Samuel F. B. Morse demonstrated the first successful telegraph in the United States. The telegraph soon gave businessmen the fastest means of communication yet known. An expanded postal system also helped speed communications.

Cultural Change. After 1820, the wilderness seemed less and less hostile to the American people. Increasingly, society glorified the frontier and nature. The public eagerly read the novels of James Fenimore Cooper, which described Indians and frontiersmen as pure of heart and noble in deeds. Ralph Waldo Emerson and other American philosophers praised nature as a source of truth and beauty available to all people, rich and poor alike.

Developments in printing spread art and information to more people than ever before. A new printing process called *lithography* enabled artists to produce many copies of their works cheaply. Large numbers of Americans bought and decorated their homes with lithographs. The lithographs of Nathaniel Currier and James Merritt Ives were especially popular. They depicted everyday American scenes, customs, and events—often in a sentimental style. Faster printing presses reduced the cost of printing newspapers. After 1835, many newspaper publishers lowered the cost of their papers to a penny, a price even poor people could afford. But the spoken word remained an important means of mass communication. Large numbers of people attended gatherings

Detail of *Stump Speaking* (1854), an oil painting on canvas by George Caleb Bingham; Boatmen's National Bank of St. Louis

Political Candidates and other orators traveled far and wide to bring their messages to frontier audiences. Public speeches from platforms like the one at the left became known as *stump speeches.*

where political candidates, pleaders of special causes, and famous clergymen and lawyers made speeches.

City people of the Expansion Era flocked to theaters to enjoy plays, minstrel shows, and other forms of entertainment. Groups of entertainers also toured the country, performing before small-town audiences. P. T. Barnum, the most famous showman of the time, fascinated the public with exhibitions of midgets, "fat ladies," and other unusual attractions.

Politics and the "Common Man"

The Election of 1824 led to renewed political friction in the United States. Four Democratic-Republicans, including John Quincy Adams and Andrew Jackson, sought to succeed Monroe as President. Jackson received the most electoral votes. But he did not win a majority, so it fell upon the House of Representatives to select the new President. The House chose Adams. Embittered, Jackson and his followers formed a separate wing of the Democratic-Republican Party, which soon developed into the Democratic Party.

Jacksonian Democracy. Adams and all the earlier Presidents came from well-to-do Eastern families. Jackson, by contrast, was born in a log cabin into a poor family. He won national fame as an Indian fighter and as a hero of the War of 1812.

Jackson ran for President again in 1828. He appealed for support from Western farmers and frontiersmen, and city laborers and craftsmen. He promised to end what he called a "monopoly" of government by the rich and to protect the interests of the "common man." His policy of equal political power for all became known as *Jacksonian Democracy.* Jackson's background and policies gained him much support in the West and in the nation's growing cities. The voters elected him President by wide margins in 1828 and again in 1832.

Jackson as President. When Jackson became President, many wealthy Easterners held what were, in effect, lifelong appointments to federal government jobs. Jackson dismissed many of these people from office, replacing them with his supporters. Some historians consider this action the start of the spoils system in the federal government. See SPOILS SYSTEM.

Jackson's main crusade against the wealthy involved the second Bank of the United States. The bank's duties included regulating the nation's money supply. Jackson believed the bank operated as a monopoly that favored the wealthy. In 1832, Congress voted to recharter the bank, but Jackson vetoed the bill. He soon withdrew the government's money from the bank, and the bank later collapsed.

The other great issue of Jackson's Administration involved the tariff and nullification. In 1828, Congress passed a bill that placed high tariffs on goods imported into the United States. The South believed the bill favored New England manufacturing interests, and denounced it as a "Tariff of Abominations." Speaking for South Carolina, Calhoun (then the Vice-President) claimed any state could nullify a federal law it deemed unconstitutional. In 1832, Congress lowered tariffs somewhat, but not enough to please South Carolina. South Carolina declared the tariff acts "null and void," and threatened to secede from the Union if the federal government tried to collect tariffs in the state. This action created a constitutional crisis. Jackson believed in states' rights, but maintained the Union must be preserved. In 1833, he persuaded Congress to pass the *Force Bill,* which allowed him to use the armed forces to collect tariffs. But Congress lowered tariffs to a point acceptable to South Carolina, and the nullification crisis ended. See NULLIFICATION.

Politics After Jackson. Jackson's influence on politics continued after he left office. As undisputed leader of the Democrats, Jackson designated Martin Van Buren to be the party's candidate in the 1836 presidential election. Jackson's opponents had formed the

Whig Party four years earlier. In an attempt to attract followers of Jackson, most Whigs supported William Henry Harrison to oppose Van Buren. Harrison, like Jackson, had won fame as a war hero. But the voters, still loyal to Jackson, elected Van Buren.

A depression called the Panic of 1837 crippled the American economy shortly after Van Buren took office, but prosperity later returned. The presidential election of 1840 again matched Van Buren and Harrison. In their campaign, the Whigs made some attempt to criticize Van Buren's economic policies, but for the most part they ignored issues. Instead, they promoted Harrison as a war hero and associated him with hard cider, the log cabin, and other symbols of the frontier. In this way, they appealed to many of Jackson's frontier supporters, and Harrison won the election.

Social Reform

During the Expansion Era, many Americans came to believe that social reforms were needed to improve their society. Churches and social groups set up charities to aid the poor and teach them how to help themselves. Reformers worked to reduce the working day of laborers from the usual 12 or 14 hours to 10 hours. Prohibitionists—convinced that drunkenness was the chief cause of poverty and other problems—persuaded 13 states to outlaw the sale of alcohol between 1846 and the Civil War. Dorothea Dix and others worked to improve the dismal conditions in the nation's prisons and insane asylums. Other important targets of reformers were women's rights, improvements in education, and the abolition of slavery.

The Drive for Women's Rights. Early American women had few rights. There were almost no colleges for women, and most professional careers were closed to them. A married woman could not own property. Instead, any property she had legally belonged to her husband. In addition, American women were barred from voting in all elections.

A women's rights movement developed after 1820, and brought about some changes. In 1835, Oberlin College became the first men's school to admit women. Other men's colleges soon began admitting women, and new colleges for women were built. In 1848, New York became the first state to allow married women to own real estate. That same year, Lucretia Mott and Elizabeth Cady Stanton organized a Woman's Rights Convention in Seneca Falls, N.Y. The convention issued the first formal appeal for *woman suffrage* (the right to vote). But nationwide suffrage did not come about until 1920.

Education Reform. In the early 1800's, most good schools in the United States were expensive private schools. Poor children went to second-rate "pauper," or "charity," schools, or did not go at all. During the 1830's, Horace Mann of Massachusetts and other reformers began demanding education and better schools for all American children. States soon began establishing public school systems, and more and more children received an education. Colleges started training teachers for a system of public education based on standardized courses of study. As a result, schoolchildren throughout the country were taught much the same lessons. For example, almost all children of the mid-1800's studied the *McGuffey*, or *Eclectic*, *Readers* to learn to read. These books taught patriotism and morality as well as reading (see McGuffey, William H.).

The Abolition Movement became the most intense and controversial reform activity of the period. Beginning in colonial times, many Americans—called *abolitionists*—had demanded an end to slavery. By the early 1800's, every Northern state had outlawed slavery. But through the years, the plantation system of farming had spread throughout the South, and the economy of the Southern States depended more and more on slaves as a source of cheap labor.

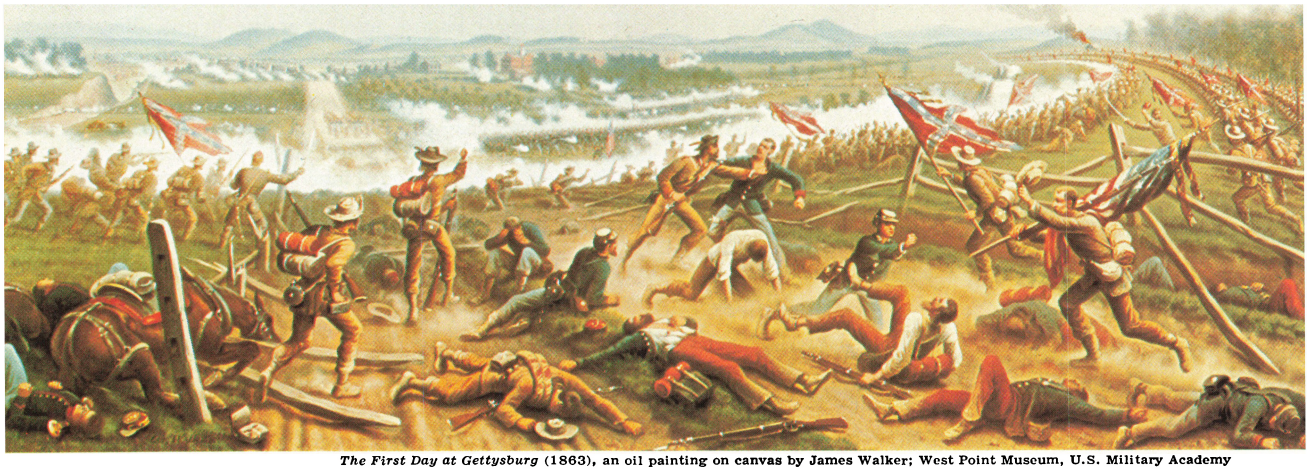
The question of whether to outlaw or allow slavery became an important political and social issue in the early 1800's. Through the years, a balance between the number of *free states* (states where slavery was prohibited) and *slave states* (those where it was allowed) had been sought. This meant that both sides would have an equal number of representatives in the United States Senate. As of 1819, the federal government had achieved a balance between free states and slave states. There were 11 of each.

When the Territory of Missouri applied for admission to the Union in 1818, bitter controversy broke out over whether to admit it as a free or slave state. In either case, the balance between free and slave states would be upset. But in 1820, the nation's leaders worked out the Missouri Compromise, which temporarily maintained the balance. Massachusetts agreed to give up the northern part of its territory. This area became the state of Maine, and entered the Union as a free state in 1820. In 1821, Missouri entered as a slave state, and so there were 12 free and 12 slave states.

The Missouri Compromise had another important provision. It provided that slavery would be "forever prohibited" in all the territory gained from the Louisiana Purchase north of Missouri's southern border, except for Missouri itself. See Missouri Compromise.

The Missouri Compromise satisfied many Americans as an answer to the slavery question. But large numbers of people still called for complete abolition. In 1821, Benjamin Lundy, a Quaker, pleaded for gradual abolition in a journal called *The Genius of Universal Emancipation*. William Lloyd Garrison, a fiery New England journalist, opposed even gradual abolition. Garrison demanded an immediate end to slavery. He founded *The Liberator*, an important abolitionist journal, in 1831. Many blacks who had gained their freedom became important spokesmen for the abolition movement. They included Frederick Douglass and Sojourner Truth. See Abolitionist.

The growing strength of the abolition movement raised fears among Southerners that the federal government would outlaw slavery. Increasingly, the South hardened its defense of slavery. Southerners had always argued that slavery was necessary to the plantation economy. But after 1830, some Southern leaders began arguing that blacks were inferior to whites, and therefore fit for their role as slaves. Even many Southern whites who owned no slaves took comfort in the belief that they were superior to blacks. As a result, Southern support of slavery increased.



The First Day at Gettysburg (1863), an oil painting on canvas by James Walker; West Point Museum, U.S. Military Academy

The Civil War ranks among the most tragic events of United States history. Fought between 1861 and 1865, it pitted Northerners against Southerners in bloody battle. In the Battle of Gettysburg, above, about 40,000 Americans were killed or wounded in just three days.

UNITED STATES HISTORY: 1850-1869 / *The Irrepressible Conflict*

The long dispute between the North and South over the issue of slavery came to a head after the Mexican War ended in 1848. The vast new area the United States had acquired in the West during the 1840's created a problem Americans could not evade. It was obvious that the new land would sooner or later be split up into territories, and then into states. Proslavery Americans—chiefly Southerners—argued against any restraints on slavery in the new territories and states. Antislavery Americans—mainly Northerners—wanted the federal government to outlaw slavery in the newly acquired lands. Still others proposed the doctrine of *popular sovereignty*. That is, they said the people of the territories and states should decide whether or not to allow slavery.

At first, the sides tried to settle their differences through debate and compromise. But the dispute over slavery proved to be an "irrepressible conflict," as Senator William H. Seward of New York termed it. During the 1850's, the North and South drew further and further apart over the issue. In the early 1860's, 11 Southern states seceded from the Union. The North insisted that the South had no right to secede and that the Union must be preserved at all costs. On April 12, 1861, the Civil War broke out between the North and South. In this tragic chapter of United States history, Americans faced Americans in bloody battle. The Civil War took more American lives than any other war. It left large parts of the South in ruins, and created long-lasting feelings of bitterness and division between the people of the North and South.

The North won the Civil War in 1865. The North's victory preserved the Union. And, soon after the war, slavery was outlawed throughout the United States.

Debate and Compromise

California applied for statehood in 1849. The application triggered debate over whether California should be admitted as a free state or a slave state. It also heightened the long-standing argument over how to deal with the slavery question.

Congressional Views. Members of Congress became spokesmen for the various views about slavery. Calhoun, then a senator from South Carolina, expressed the views of Americans who believed in the right to own slaves. Senator Seward was one of many spokesmen for people with strong antislavery beliefs. He said moral law—a higher law than the Constitution—required that the government abolish slavery nationwide. Senator Clay of Kentucky represented Americans who held views between those of Calhoun and Seward. Clay urged both the North and South to compromise because—he said—the alternative was the end of the Union.

The Compromise of 1850. Clay and others succeeded in bringing about agreement on the California slavery question. They won approval of the Compromise of 1850, a series of laws that made concessions to both the North and South. Measures designed to satisfy the North included the admission of California to the Union as a free state and the abolition of the slave trade in Washington, D.C. As part of the Compromise, Congress created the territories of New Mexico and Utah. To try to satisfy Southerners, Congress ruled that when these territories became states, the residents would de-

cide whether or not to allow slavery. Also for the South, Congress agreed to strict measures designed to aid the capture of runaway slaves.

Many Americans thought the Compromise of 1850 provided a final solution to the slavery problem. The Compromise did cool the heated argument over the issue—but only for a while. See COMPROMISE OF 1850.

The Kansas-Nebraska Act. In the early 1850's, Congress began considering the creation of new territories in the area roughly between Missouri and present-day Idaho. Bitter debate flared up over whether the territories should ban or allow slavery. Those who called for a ban cited the Missouri Compromise to back their position. The land under consideration was part of the area in which the Compromise had "forever prohibited" slavery. But on May 25, 1854, Congress passed the Kansas-Nebraska Act, a law that changed this provision. The law created two territories west of Missouri—Kansas and Nebraska. It provided that the people of Kansas and Nebraska would decide whether or not to allow slavery. See KANSAS-NEBRASKA ACT.

Nationwide Turmoil

Few, if any, American laws have had more far-reaching effects than the Kansas-Nebraska Act. Furious antislavery Americans denounced both Northerners and Southerners who had supported the act. Others staunchly defended the act. Everywhere, attitudes toward the slavery question hardened, and capacity for further compromise diminished. Political and social turmoil swept through the country, and the United States was on the road to war.

Political and Institutional Splits. Angered by the Kansas-Nebraska Act, a group of antislavery Americans formed the Republican Party in 1854. Many Democrats and Whigs who opposed slavery left their parties and became Republicans. Other Americans, puzzled by the national turmoil, sought simple answers to the country's problems. They joined the Know-Nothing (or Ameri-

Period Facts in Brief

Presidents (with political parties and dates of service)

Zachary Taylor, Whig, 1849-1850
Millard Fillmore, Whig, 1850-1853
Franklin Pierce, Democrat, 1853-1857
James Buchanan, Democrat, 1857-1861
Abraham Lincoln, Republican, 1861-1865
Andrew Johnson, National Union, 1865-1869
Ulysses S. Grant, Republican, 1869-1877

States in the Union

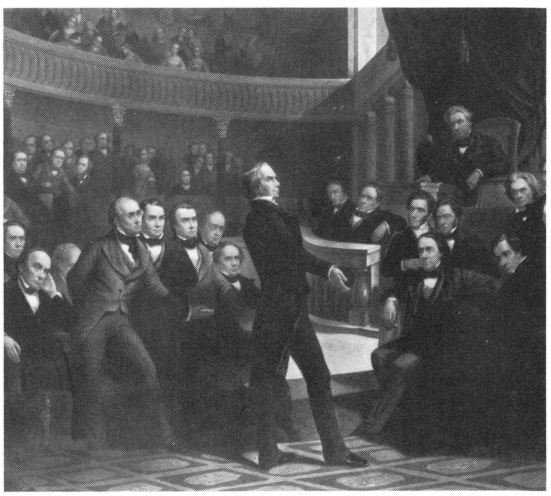
Number at start of period: 30
Number at end of period: 37
States added during the period:
California (1850), Minnesota (1858), Oregon (1859), Kansas (1861), West Virginia (1863), Nevada (1864), Nebraska (1867).

Important Dates

1850 The Compromise of 1850 temporarily ended a national crisis over the slavery question.
1854 Passage of the Kansas-Nebraska Act led to nationwide turmoil over the slavery issue.
1856 The first American kindergarten opened in Watertown, Wis.
1860 Pony express riders began carrying mail from St. Joseph, Mo., to the Far West.
1861-1865 The North and the South fought each other in the Civil War.
1863 The Emancipation Proclamation declared freedom for all slaves in Confederate-held territory.
1865 The 13th Amendment outlawed slavery throughout the United States.
1867 The United States bought Alaska from Russia.
1868 The House of Representatives impeached President Andrew Johnson, but the Senate did not remove him from office.

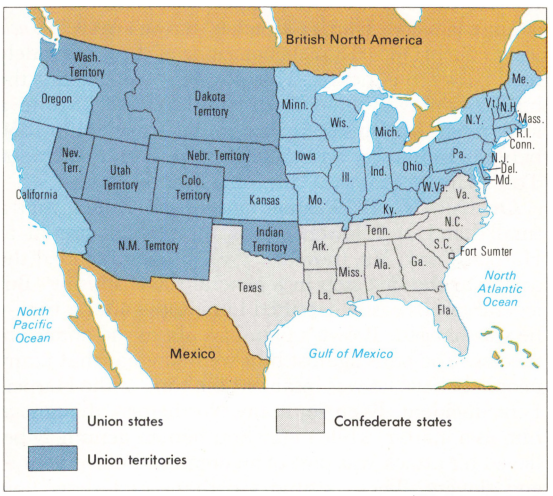
Population Growth and Change

1850 — Total population, 23,191,876; Rural, 85%; Urban, 15%
1869 — Total population, 37,816,000; Rural, 75%; Urban, 25%



The Old Print Shop, Inc., New York City

The Compromise of 1850 temporarily cooled the heated dispute over slavery between the North and South. Henry Clay, *center above,* led the effort in Congress to pass the Compromise.



WORLD BOOK map

The Civil War (1861-1865) split the nation into two parts—the Confederacy and the Union. The Confederacy was made up of 11 Southern States that withdrew from the Union in 1860 and 1861.

Detail of *The Slave Auction* (1862), an oil painting on canvas by Eyre Crowe; Kennedy Galleries, Inc., New York City

Slaves Were Sold at public auctions in the South. Pictures of blacks being sold like merchandise stirred much resentment against slavery in the North.

can) Party, which blamed the problems on immigrants and Roman Catholics.

The stability of the two main political parties before 1854 had helped keep the nation together. Thus, the political splits deprived the country of an important unifying force. Religious denominations had also been a unifying force. But beginning in the 1840's, large church groups split along sectional lines and another unifying institution was lost. By the mid-1850's, the Supreme Court seemed to be the only institution to command nationwide respect. But in 1857, the court ruled—in the Dred Scott Decision—that Negroes were not citizens and that laws limiting the spread of slavery were unconstitutional. The court then lost much of its influence in the North. See DRED SCOTT DECISION.

Social Disorder. After 1854, Southerners increasingly referred to themselves as a separate national group. In the North, abolitionists stepped up their campaign against slavery. Harriet Beecher Stowe's novel *Uncle Tom's Cabin* (1851-1852) became one of the most widely read books in America. This powerful work about the horrors of slavery helped stir antislavery feelings to a fever pitch. In Kansas, fierce fighting broke out in 1856 between proslavery and antislavery settlers. See UNCLE TOM'S CABIN; KANSAS ("Bleeding Kansas").

On Oct. 16, 1859, abolitionist John Brown and a small band of followers seized the federal arsenal at Harpers Ferry, Va. (now W. Va.). Brown intended the action as the first step in a general slave uprising. But federal troops easily captured him, and—after a trial—he was hanged. Brown's plan had almost no chance of success. The odds against him were so great that many people believe he was insane at the time of the Harpers Ferry incident. Even so, many Northerners thought of him as a martyr, while many Southerners genuinely believed his attack was part of an organized movement to end slavery. These attitudes perhaps best show how divided the United States had become in the 1850's.

The Election of 1860 also reflected the nation's division. The Democratic Party split into Northern and Southern wings, with each wing slating its own candidate for President. The Whig Party, weakened by desertions, disbanded before the election. Conservative Whigs and Know-Nothings formed the Constitutional Union Party, which ran its own candidate for President. Only the Republicans remained united. They nominated Abraham Lincoln, an Illinois lawyer, for President. The Republican unity helped Lincoln win the election on Nov. 6, 1860.

Secession. Lincoln had earned a reputation as an opponent of slavery, and his election was unacceptable to the South. Southerners feared the new President would restrict or end slavery. Alarmed by this prospect, South Carolina seceded from the Union on Dec. 20, 1860, well before Lincoln took office. Alabama, Florida, Georgia, Louisiana, and Mississippi seceded in January, 1861. The six seceded states formed the Confederate States of America in February. Later in 1861, Arkansas, North Carolina, Tennessee, Texas, and Virginia seceded and joined the Confederacy.

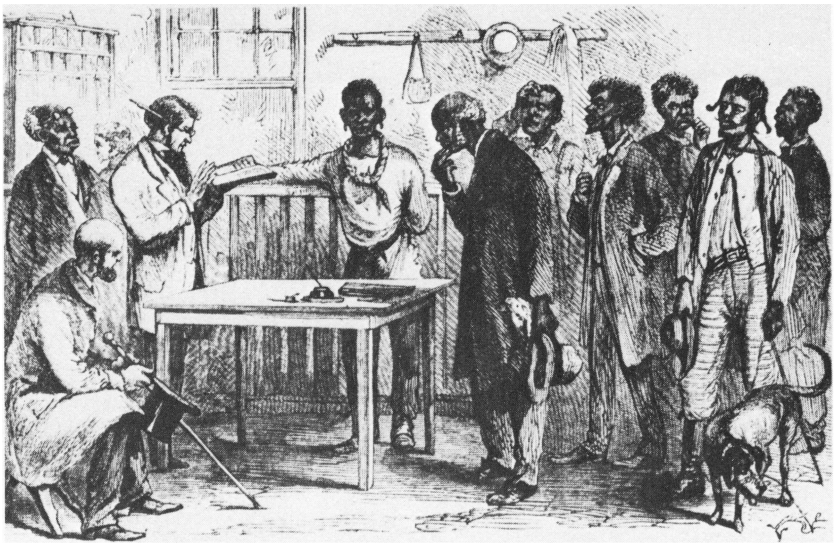
Lincoln took office on March 4, 1861. The new President insisted above all else on the preservation of the Union. To him, the seceded states were still part of the United States, and there was yet hope for reconciliation. But a little more than a month later, the North and South were at war.

The Civil War and Reconstruction

The Civil War began on April 12, 1861, when Southern troops fired on Fort Sumter, a military post in Charleston Harbor. Both sides quickly prepared for battle after the Fort Sumter clash. The North had superior financial and industrial strength, and more manpower than the South. But the South fought valiantly to defend its cause. The South gained the upper hand at first, but the North gradually turned the tide. Finally, Confederate resistance wore down, and Union armies swept through the South. On April 9, 1865, General

Library of Congress

The South Lay in Ruins at the end of the Civil War. A scene showing shells of burned-out buildings in Richmond, Va., *above*, provides an example of the destruction brought on by the war.



Harper's Weekly

Reconstruction Measures passed by Congress after the Civil War included the establishment of election boards to register black voters. The scene at the left shows blacks lined up to register in Macon, Ga.

Robert E. Lee—commander of the Confederate Army—surrendered to the Union commander General Ulysses S. Grant at Appomattox Court House in Virginia. The last Confederate troops surrendered on May 26.

The four years of bloody fighting between the North and South had staggering effects on the nation. About 360,000 Union troops and perhaps 260,000 Confederate troops—all Americans—died in the conflict. No other war in history has taken so many American lives. Property damage was enormous, especially in the South. Many Southern cities, towns, plantations, factories, and railroads lay in ruin. The war also took an emotional toll on the nation. It caused deep and long-lasting feelings of bitterness and division between the people of the North and the South.

For a detailed account of the war, see CIVIL WAR.

The Emancipation Proclamation. At the start of the Civil War, Lincoln's main goal was the preservation of the Union. But as battlefield casualties mounted, he decided that another goal—the emancipation of the slaves—was necessary to justify the cost of the war. On Jan. 1, 1863, Lincoln issued the Emancipation Proclamation. The proclamation declared freedom for all slaves in the areas under Confederate control at the time. See EMANCIPATION PROCLAMATION.

Reconstruction. Toward the end of the Civil War, the North set out to establish terms under which Confederate states would be readmitted to the Union. The process through which the South returned, as well as the period following the war, is called *Reconstruction*.

Northerners divided into two groups over Reconstruction policy. One group, called the *moderates*, wanted to end the bitterness between the North and South and favored avoiding harsh treatment of the rebels. Members of the other group, the *radicals*, believed the South should be punished for its rebellion. They also wanted a policy that would ensure that blacks received better treatment in the South than they had before the war.

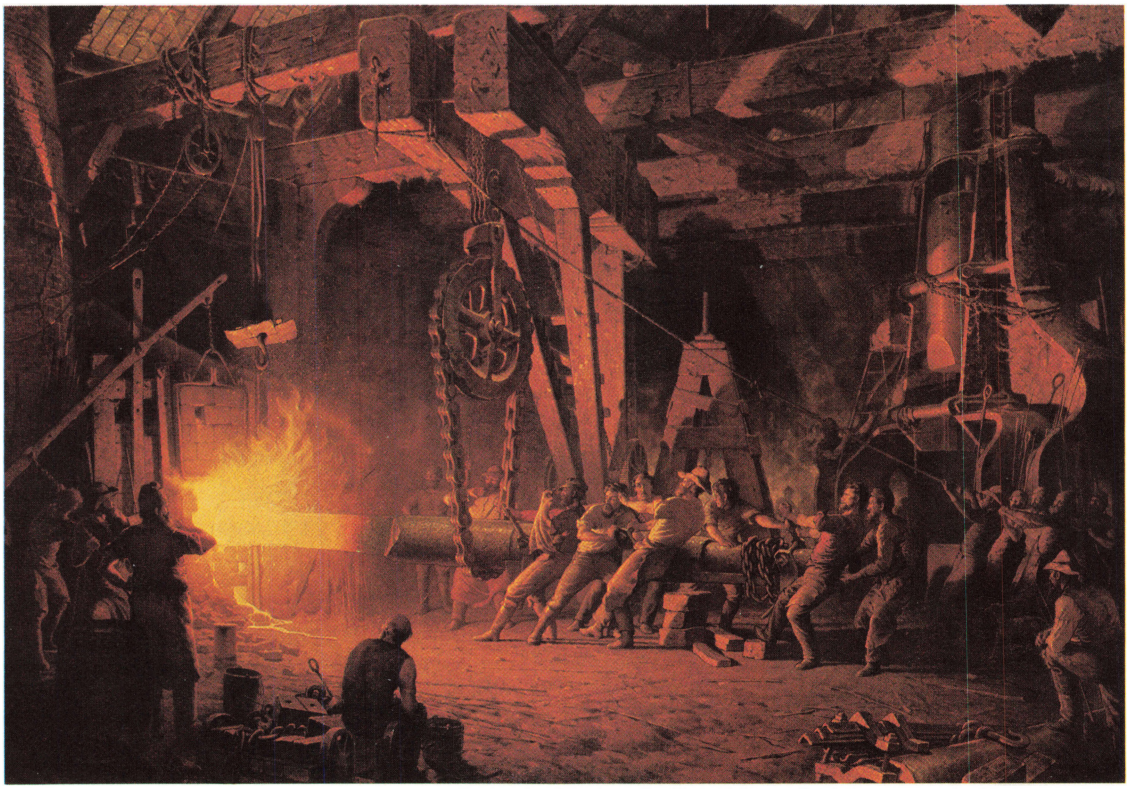
President Lincoln led the moderates. But assassin John Wilkes Booth shot him on April 14, 1865. Lincoln died the next day, less than a week after Lee's surrender. Vice-President Andrew Johnson became President. He tried to carry out Lincoln's moderate policy, but he was unable to overcome radical opposition. The radicals included many of the most powerful Republican members of Congress. They controlled enough votes in Congress to push through their own Reconstruction policy and override Johnson's vetoes. Johnson's opposition to the radicals almost led to his removal from office. In 1868, the House of Representatives impeached the President. But the Senate voted against removing him from office by the margin of a single vote. For details, see JOHNSON, ANDREW.

The Reconstruction program drafted by Congress included laws to further the rights of blacks. The 13th Amendment to the Constitution (1865) outlawed slavery throughout the United States. The 14th Amendment (1868) confirmed the citizenship of Negroes, and the 15th Amendment (1870) made it illegal to deny the right to vote on the basis of race.

Congress also stationed troops in the South. Republicans, protected by the troops, took control of local Southern governments. White Southerners loyal to their old traditions bitterly resented the new political system. Many of them joined the Ku Klux Klan, a secret society that used violence to keep blacks from voting and trying to achieve equality (see KU KLUX KLAN).

Congress insisted that the Confederate states agree to follow all federal laws before being readmitted to the Union. Between 1866 and 1870, all the Confederate states returned to the Union. By the early 1870's, interest in Reconstruction in the North had faded. However, Reconstruction did not end officially until 1877, when the last federal troops left the South.

Reconstruction had limited success. It expanded the legal rights of Negroes, and some blacks advanced politically. But the old social order, based on white supremacy, soon returned to the South. The fundamental problem of the black's place in society remained to haunt future generations. See RECONSTRUCTION.



Forging the Shaft: A Welding Heat (1877), an oil painting on canvas by John Ferguson Weir; The Metropolitan Museum of Art, New York City, Gift of Lyman G. Bloomingdale, 1901

America Became an Industrial Giant during the late 1800's. The nation's factories, such as the iron foundry above, began turning out products on a much larger scale than before. Millions of rural Americans and immigrants flocked to the country's cities to work in the booming industries.

UNITED STATES HISTORY: 1870-1916/*Industrialization and Reform*

The industrial growth that began in the United States in the early 1800's continued steadily up to and through the Civil War. Still, by the end of the war, the typical American industry was small. Hand labor remained widespread, limiting the production capacity of industry. Most businesses served a small market and lacked the capital needed for business expansion.

After the Civil War, however, American industry changed dramatically. Machines replaced hand labor as the main means of manufacturing, increasing the production capacity of industry tremendously. A new nationwide network of railroads enabled businessmen to distribute goods far and wide. Inventors developed new products the public wanted, and businessmen made the products in large quantities. Investors and bankers supplied the huge amounts of money that businessmen needed to expand their operations. Many big businesses grew up as a result of these and other developments. They included coal mining, petroleum, and railroad companies; and manufacturers and sellers of such products as steel, industrial machinery, automobiles, and clothing.

The industrial growth had major effects on American life. The new business activity centered in cities. As a result, people moved to cities in record numbers, and the cities grew by leaps and bounds. Many Americans amassed huge fortunes from the business boom, but others lived in extreme poverty. The sharp contrast between the rich and the poor and other features of American life stirred widespread discontent. The discontent triggered new reform movements, which—among other things—led to measures to aid the poor and control the size and power of big business.

The industrial growth centered chiefly in the North. The war-torn South lagged behind the rest of the country economically. In the West, frontier life was coming to a close.

America's role in foreign affairs also changed during the late 1800's and early 1900's. The country built up its military strength and became a world power.

The Rise of Big Business

The value of goods produced by American industry increased almost tenfold between 1870 and 1916. Many interrelated developments contributed to this growth.

Improved Production Methods. The use of machines in manufacturing spread throughout American industry after the Civil War. With machines, workers

could produce goods many times faster than they could by hand. The new large manufacturing firms hired hundreds, or even thousands, of workers. Each worker was assigned a specific job in the production process. This system of organizing laborers, called the *division of labor*, also sped up production. The increased production speed had a tremendous impact on the economy. It enabled businessmen to charge lower prices for products. Lower prices, in turn, meant more people could afford the products, and so sales soared.

Development of New Products. Inventors created, and businessmen produced and sold, a variety of new products. The products included the typewriter (1867), barbed wire (1873), the telephone (1876), the phonograph (1877), the electric light (1879), and the gasoline automobile (1885). Of these, the automobile had the greatest impact on the nation's economy. In the early 1900's, Ransom Eli Olds and Henry Ford began turning out cars by mass production. Automobile prices dropped, and sales soared. The number of automobiles owned by Americans jumped from 8,000 in 1900 to almost 3,500,000 in 1916.

Natural Resources. America's rich and varied natural resources played a key role in the rise of big business. The nation's abundant water supply helped power the industrial machines. Forests provided lumber for construction and wooden products. Miners took large quantities of coal and iron ore from the ground. Andrew Carnegie and other businessmen made steel from these minerals. Steel played a vital role in the industrialization process. It was used to build machines, railroad tracks, bridges, automobiles, and skyscrapers. Other industrially valuable minerals included copper, silver, and petroleum. Petroleum—the source of gasoline—became especially important after the automobile came into widespread use in the early 1900's.

A Growing Population. More than 25 million immigrants entered the United States between 1870 and

Period Facts in Brief

Presidents (with political parties and dates of service)

Ulysses S. Grant, Republican, 1869-1877
Rutherford B. Hayes, Republican, 1877-1881
James A. Garfield, Republican, 1881
Chester A. Arthur, Republican, 1881-1885
Grover Cleveland, Democrat, 1885-1889
Benjamin Harrison, Republican, 1889-1893
Grover Cleveland, Democrat, 1893-1897
William McKinley, Republican, 1897-1901
Theodore Roosevelt, Republican, 1901-1909
William H. Taft, Republican, 1909-1913
Woodrow Wilson, Democrat, 1913-1921

States in the Union

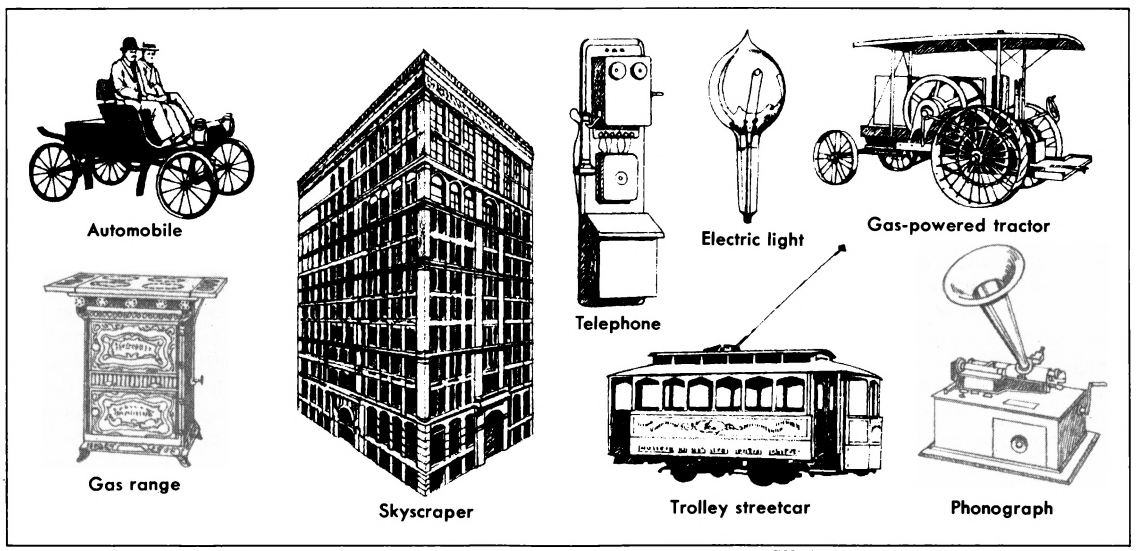
Number at start of period: 37
Number at end of period: 48
States added during the period:
Colorado (1876), North Dakota (1889), South Dakota (1889), Montana (1889), Washington (1889), Idaho (1890), Wyoming (1890), Utah (1896), Oklahoma (1907), New Mexico (1912), Arizona (1912).

Important Dates

1876 Alexander Graham Bell invented the telephone.
1877 Thomas Edison invented the phonograph.
1879 Edison invented the electric light.
1884 The world's first skyscraper was begun in Chicago.
1886 The American Federation of Labor was founded.
1898 The United States defeated Spain in the Spanish-American War.
1903 The Wright Brothers made the first successful airplane flight at Kitty Hawk, N.C.
1913 The 16th Amendment gave the federal government the power to levy an income tax.
1914 World War I began in Europe.

Population Growth and Change

1870 — Total population, 38,558,371; Rural, 74%; Urban, 26%
1916 — Total population, 99,871,604; Rural, 51%; Urban, 49%



WORLD BOOK illustrations by David Cunningham

Many New Products came into use during the period of industrialization. Their manufacture and sale contributed greatly to the economic boom. Some of the new products are shown above.

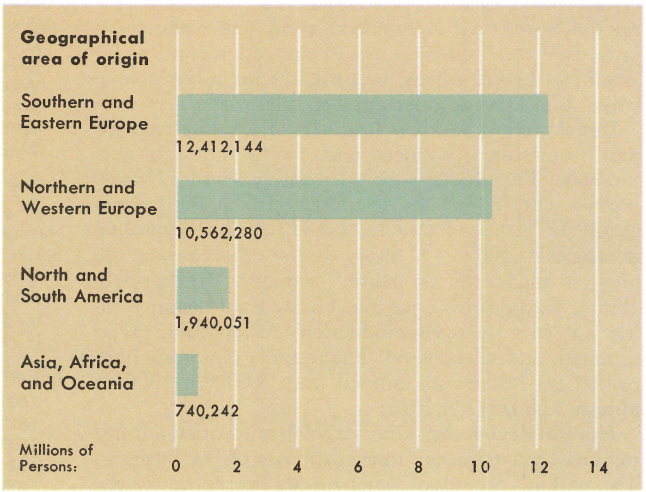
Alfred Stieglitz photo; The Museum of Modern Art

Immigrants flocked into the United States by the millions during the late 1800's and early 1900's. A shipload of newcomers from Europe is shown above.

Immigration to the United States Between 1870 and 1916

The largest number of immigrants between 1870 and 1916 came from southern and eastern Europe. Earlier, the number of immigrants from northern and western Europe had far surpassed the total from any other part of the world.

Source: U.S. Bureau of the Census



1916. Immigration plus natural growth caused the U.S. population to more than double during the same period, rising from about 40 million to about 100 million. Population growth helped the economic boom in two ways. It increased the number of consumers, and thus enlarged the market for products. It also provided the additional workers needed for the jobs created by the new business activity.

Distribution, Sales, and Communication. In the late 1800's, the American railroad system became a nationwide transportation network. The distance of all railroad lines in operation soared from about 9,000 miles (14,500 kilometers) in 1850 to almost 200,000 miles (320,000 kilometers) in 1900. A high point in railroad development came in 1869, when workers laid tracks that joined the Central Pacific and Union Pacific railroads near Ogden, Utah. This event marked the completion of the world's first transcontinental railroad system. The system linked the United States by rail from coast to coast.

The new railroads spurred economic growth. Mining companies used them to ship raw materials to factories over long distances quickly. Manufacturers distributed their finished products by rail to points throughout the country. The railroads became highly profitable businesses for their owners, including Cornelius Vanderbilt and Jay Gould.

Improved sales methods also aided economic growth. Owners of big businesses sent salesmen to all parts of the country to promote their products. Enterprising merchants opened huge department stores in the growing cities. They included Marshall Field of Chicago, R. H. Macy of New York, and John Wanamaker of Philadelphia. The stores offered a wide variety of products at reasonable prices. Other merchants—including Montgomery Ward and Richard Sears—began mail-order companies, chiefly to serve people who lived far from stores. The companies published catalogs that showed their products. Buyers used the catalogs to order goods by mail.

Advances in communication provided a boost for the economy. Railroads replaced such mail-delivery systems as the stagecoach. In 1876, Alexander Graham Bell invented the telephone. These developments, along with the telegraph, provided the quick communication that is vital to the smooth operation of big business.

Investment and Banking. The business boom triggered a sharp increase in investments in the stocks and bonds of corporations. As businesses prospered, persons eager to share in the profits invested heavily. Their investments provided capital that companies needed to expand their operations.

New banks sprang up throughout the country. Banks helped finance the nation's economic growth by making loans to businesses. Some bankers of the era, especially J. P. Morgan, assumed key positions in the American economy because of their ability to provide huge sums of capital.

Monopolies. The government did little to regulate business during the 1800's. Unrestricted, American businessmen struggled to wipe out competition and gain complete control of their industries. They formed monopolies, which—for the most part—are illegal today. Some businessmen in the same industry *merged* (united to form a single company) in order to reduce or eliminate competition. Other businessmen formed *trusts*. A trust was a monopoly in which a group of managers controlled rival businesses without formal ownership (see MONOPOLY AND COMPETITION; TRUST).

The monopolies had some favorable effects on the economy. They helped make possible the giant, efficient corporations that contributed so much to economic

growth. The monopolies also enabled businessmen to avoid sharp fluctuations in price and output, and thus keep sales steady. On the other hand, monopolies gave some businessmen so much power that they could take unfair advantage of others. A businessman with little or no competition could demand goods from suppliers at low cost, while charging high prices for his products. The businessman could also save money by reducing the quality of his products.

The South and the West

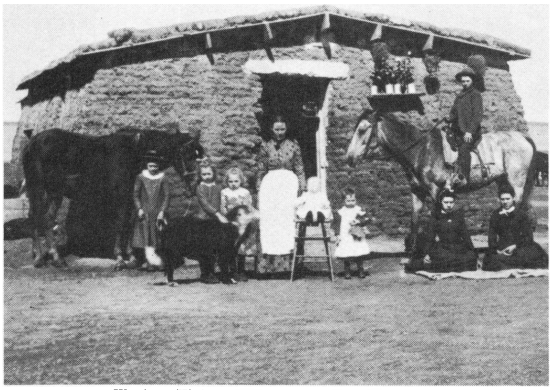
The War-Torn South. After the Civil War, Americans in the South faced the task of rebuilding their war-torn society. The South lagged behind the rest of the nation economically. Some industry developed in the region, but the South remained an agricultural area throughout the period of industrialization.

Many Southern farmers—both black and white—owned the land they worked. But in general, the land of these small, independent farmers was poor. The best land was given over to tenant farming—a system in which laborers farm the land and pay rent in money or crops to the owner. The tenant farming system had neither the virtues of the plantation system of pre-Civil War days nor of the independent owner system. The tenant farmers lacked the incentive to improve land that was not their own, and the owners did not have full control over production. For these and other reasons, agriculture remained more backward in the South than elsewhere.

The End of the Western Frontier. The long process of settling the United States from coast to coast drew to a close after the Civil War. In 1862, Congress passed the Homestead Act, which offered public land to people free or at very low cost. Thousands of Americans and immigrants started farms in the West under the provisions of the act. They settled chiefly on the Great Plains, which—contrary to earlier beliefs—included much excellent farmland. Miners flocked to the West as the demand for minerals soared. Towns sprang up near the mines. Cattle ranching spread throughout the Southwest after the Civil War.

After 1870, settlement became so widespread in the West that it was no longer possible to draw a continuous frontier line. The United States Census of 1890 officially recognized the fact that America's frontier had ended. See WESTWARD MOVEMENT (The Last Frontiers); WESTERN FRONTIER LIFE.

The settlement of the West brought an end to the American Indian way of life. Farmers occupied and fenced in much of the land. White men moving westward slaughtered buffalo herds on which Indians depended for survival. Some Indians retaliated against the whites by attacking wagon trains and homes. But as in earlier days, the federal government sent soldiers to crush the Indian uprisings. In the end, the Indians were no match for the soldiers and their superior weapons. Through the years, the federal government pushed more and more Indians onto reservations. Reservation Indians suffered from poverty and illness, and could not adjust to the new way of life forced upon them. By 1900, the separate Indian way of life had become a thing of the past. For more details, see INDIAN, AMERICAN (The Fall of Indian America); INDIAN RESERVATION; INDIAN TERRITORY; INDIAN WARS.



Western History Collections, University of Oklahoma Library

Farmers Flocked to the Great Plains during the late 1800's. The Kansas farm family above built their house from sod. The Plains had few trees, and so lumber for building was scarce.

Life During the Industrial Era

The industrial boom had major effects on the lives of the American people. The availability of jobs in industries drew people from farms to cities in record numbers. In 1870, only about 25 per cent of the American people lived in urban areas. By 1916, the figure had reached almost 50 per cent.

The lives of people in the cities contrasted sharply. A small percentage of them had enormous wealth and enjoyed lives of luxury. Below them economically, the larger middle class lived comfortably. But at the bottom of the economic ladder, a huge mass of city people lived in extreme poverty.

The Wealthy. The business boom opened up many opportunities for financial gain. The economic activity it generated enabled many people to establish successful businesses, expand existing ones, and profit from investments. Some businessmen and investors were able to amass huge fortunes. The number of millionaires in the United States grew from perhaps about 20 in 1850 to more than 3,000 in 1900. Among the millionaires was a small group who accumulated fortunes of more than $100 million each. They included Andrew Carnegie, Marshall Field, J. P. Morgan, John D. Rockefeller, and Cornelius Vanderbilt. The wealthy Americans built enormous mansions, wore the finest clothing, ate in the best restaurants, and could afford to buy almost anything they desired.

The Middle Class. Other city people prospered enough to live lives of comfort, if not wealth. They included owners of small businesses, and such workers as factory and office managers. They became part of America's growing middle class.

The Underprivileged. The laborers who toiled in factories, mills, and mines did not share in the benefits of

Jacob A. Riis photo; Museum of the City of New York, Jacob A. Riis Collection

The Antique Shop, an oil painting on canvas by Louis Charles Moeller; Collection of Mr. and Mrs. George J. Arden

The Lives of the Poor and the Rich contrasted sharply during the industrial period. Poor city people, *left*, lived in a crowded tenement and could barely afford the necessities of life. But the wealthy, such as the well-dressed antique shoppers at the right, enjoyed lives of luxury.

the economic growth. They usually worked at least 60 hours a week for an average pay of about 20 cents an hour, and had no fringe benefits.

As the nation's population grew, so did the competition for jobs. The supply of workers outstripped the demand. Businessmen felt little pressure to improve the lot of workers. They knew that job competition meant poor people would work under almost any conditions. The oversupply of workers led to high unemployment. In addition, depressions slowed the economy to a near standstill in 1873, 1884, 1893, and 1907. Unemployment soared during the depressions. Workers suffered through the periods of idleness without the unemployment benefits that are available today. Such economic hardship meant that, in many cases, every family member except very young children had to seek a job.

The everyday life of the city poor was dismal and drab. The poor lived crowded together in slums. Much of their housing consisted of cheap apartment buildings called *tenements*. The crowded slum neighborhoods bred crime. Overwork, poor sanitation, and inadequate diet left slum dwellers vulnerable to disease. Many poor children received little or no education, because they had to work to contribute to their families' welfare. In addition, schools in the slums were poorly equipped for educating those who attended them.

In spite of harsh living conditions, hope made the lives of many of the poor tolerable. The poor knew that economic advancement was possible in the United States. Some families, through hard work and saving, were able to start small businesses. And—even if a worker himself could not advance economically—he believed that in America his children would.

The Farmers. American farmers also suffered hardships after the Civil War. Advances in agricultural equipment and techniques had enabled most of the farmers to increase their production. However, *middlemen* between the farmers and the consumers took a large share of the money earned from farm products. The middlemen included owners of railroads, grain elevators, mills, and gins.

The Gilded Age. American author Mark Twain called the era of industrialization "The Gilded Age." Twain used this term to describe the culture of the newly rich of the period. Lacking tradition, the wealthy developed a showy culture supposedly based on the culture of upper-class Europeans. The enormous mansions of the newly rich Americans imitated European palaces. The wealthy filled the mansions with European art works, antiques, rare books, and gaudy decorations. They spent their leisure time attending operas, relaxing at luxurious resorts, or engaging in other functions they believed were signs of refinement.

Most Americans, however, had a far different idea of culture. They enjoyed fairs that exhibited industrial machines, the latest inventions, and other items related to America's material progress. The fairs included the Philadelphia Centennial Exposition of 1876 and the Chicago World's Columbian Exposition of 1893. The American people were eager spectators at circuses, vaudeville shows, and sporting events. Baseball became so popular after 1900 that it was called the *national pastime*. Also after 1900, a new kind of entertainment, the motion picture, began attracting public interest. Many Americans of the industrial era enjoyed playing popular songs from sheet music on parlor pianos, or, after 1877, from records on crude phonographs. The people liked magazines filled with pictures, and *dime novels*—inexpensive books that emphasized adventure and the value of hard work and courage.

Government and the People. After the Civil War, the Democratic and Republican parties developed strong *political machines*. Members of these organizations kept

in contact with the people, and did them favors in return for votes. But in general, political and government leaders strongly favored business interests. They did little to interfere with business or to close the gap between the rich and poor.

Government of the era was also marked by widespread corruption. Ulysses S. Grant became President in 1869. Members of Grant's Administration used their government positions for their own financial gain (see GRANT, ULYSSES S. [Political Corruption; Government Frauds]). Corruption also flourished in state and local government. The people seemed little concerned, however. For example, in 1872, Grant won a second term and received more votes than he did the first time.

Reform

A strong spirit of reform swept through the United States during the late 1800's and early 1900's. Large numbers of Americans called for changes in the country's economic, political, and social systems. The reformers wanted to reduce poverty, improve the living conditions of the poor, and regulate big business. They worked to end corruption in government, make government more responsive to the people, and accomplish other goals.

During the 1870's and 1880's, the reformers made relatively little progress. But after 1890, they gained much public support and influence in government. By 1917, the reformers had brought about many changes. Some reformers called themselves *progressives*. As a result, the period of American history from about 1890 to about 1917 is often called the *Progressive Era*.

Early Reform Efforts included movements to organize laborers and farmers. In 1886, skilled laborers formed the American Federation of Labor (AFL)—now the American Federation of Labor-Congress of Industrial Organizations (AFL-CIO). Led by Samuel Gompers, this union bargained with employers and gained better wages and working conditions for its members. Farmers founded the National Grange in 1867 and Farmers' Alliances during the 1870's and 1880's. These groups helped force railroads to lower their charges for hauling farm products and assisted the farmers in other ways.

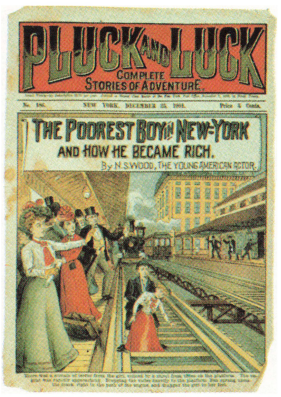
Unskilled laborers had less success in organizing than did skilled laborers and farmers. The Knights of Labor, a union open to both the unskilled and skilled workers, gained a large membership during the 1880's. But its membership declined sharply after the Haymarket Riot of 1886. In this incident, someone threw a bomb in Haymarket Square in Chicago during a labor dispute. The bomb killed eight policemen and two other persons. Many Americans blamed the disaster on the labor movement. The Haymarket Riot aroused antilabor feelings and weakened the cause of unskilled workers.

The drive for woman suffrage became strong after the Civil War. In 1869, Susan B. Anthony and Elizabeth Cady Stanton founded the National Woman Suffrage Association. The Territory of Wyoming gave women the right to vote the same year. Soon, a few states allowed women to vote, but only in local elections.

Early reformers brought about some changes in government. In 1883, their efforts led to passage of the Pendleton, or Civil Service, Act. This federal law set up the Civil Service Commission, an agency charged with granting federal government jobs on the basis of merit, rather than as political favors. The commission was the first federal government regulatory agency in the nation's history. In 1884, Democrats and liberal Republicans joined together to elect Grover Cleveland President. A reform-minded Democrat, Cleveland did much to enforce the Pendleton Act.

The Progressive Era. The outcry for reform increased sharply after 1890. Clergymen, social workers, and others studied life in the slums and reported on the awful living conditions there. Educators criticized the nation's school system. A group of writers—called *muckrakers* by their critics—published exposés about such evils as corruption in government and how some businessmen cheated the public. The writers included Upton Sinclair, Lincoln Steffens, and Ida M. Tarbell. Increasingly, unskilled workers resorted to strikes in an attempt to gain concessions from their employers. Often, violence broke out between the strikers and strikebreakers hired by the employers. Socialists and others who opposed the U.S. economic system of capitalism supported the strikers and gained a large following.

Corning-Painted Post Historical Soc., Corning, N.Y.



Sy Seidman (WORLD BOOK photo)

Culver

Popular Entertainment of the period included circuses, dime novels, and—after 1900—motion pictures. A circus parade through a small-town street, *left*, was a highly exciting event. A dime novel, *center*, taught the value of courage. Many movies featured slapstick comedy, *right*.

These and other developments caused many middle-class and some upper-class Americans to back reforms. The people wondered about the justice of a society that tolerated such extremes of poverty and wealth. More and more, the power of big business, corruption in government, violent strikes, and the inroads of socialism seemed to threaten American democracy.

As public support for reform grew, so did the political influence of the reformers. In 1891, farmers and some laborers formed the People's, or Populist, Party. The Populists called for government action to help farmers and laborers. They gained a large following, and convinced many Democrats and Republicans to support reforms. See POPULIST PARTY.

Reformers won control of many city and some state governments. They also elected many congressmen who favored their views. In addition, the first three Presidents elected after 1900—Theodore Roosevelt, William Howard Taft, and Woodrow Wilson—supported certain reform laws. These political developments resulted in a flood of reform legislation on the local, state, and federal levels.

Local and State Legislation. Reformers in local and state government passed many laws to help the poor. Such laws provided for tenement house inspection, playgrounds, and other improvements of life in the slums. Some reform governments expanded public education and forced employers to protect workers against fires and dangerous machinery in factories. The many reformers in local and state government included mayors Samuel M. "Golden Rule" Jones of Toledo, Ohio, and Tom L. Johnson of Cleveland; and governors Woodrow Wilson of New Jersey and Robert M. "Battling Bob" La Follette of Wisconsin. Wisconsin went so far as to pass an income tax, a measure bitterly opposed by the wealthy Americans.

Federal Legislation. In 1890, the federal government passed the Sherman Antitrust Act. This act outlawed trusts and other monopolies that hindered free trade. But the government did little to control monopolies until after Theodore Roosevelt became President in 1901. Roosevelt was a liberal Republican who called for a "square deal" for all Americans. He won lasting fame as a "trust buster." Roosevelt did not oppose monopolies altogether, but he believed they should be regulated whenever they operated against the public interest. In 1903, Roosevelt established the Bureau of Corporations, an agency that collected information on businesses. When the bureau found that a business was violating the Sherman Antitrust Act, the government sued. During Roosevelt's presidency, the government brought suits against more than 40 companies. The most famous suit broke up John D. Rockefeller's Standard Oil Company in 1911.

Roosevelt became the first President to aid laborers in a strike against employers. In 1902, the United Mine Workers struck for better wages and working conditions. Roosevelt asked the miners and the mine owners to settle their differences through arbitration, but the mine owners refused. Angered, the President threatened to have the Army take over the mines. The owners gave in, and reached a compromise with the miners.

In 1906, Upton Sinclair published *The Jungle*, a novel about unsanitary conditions in the meat-packing industry. Roosevelt ordered an investigation of Sinclair's charges, and found they were true. At Roosevelt's urging, Congress passed the Meat Inspection Act and the Federal Food and Drugs Act to regulate food and drug processing.

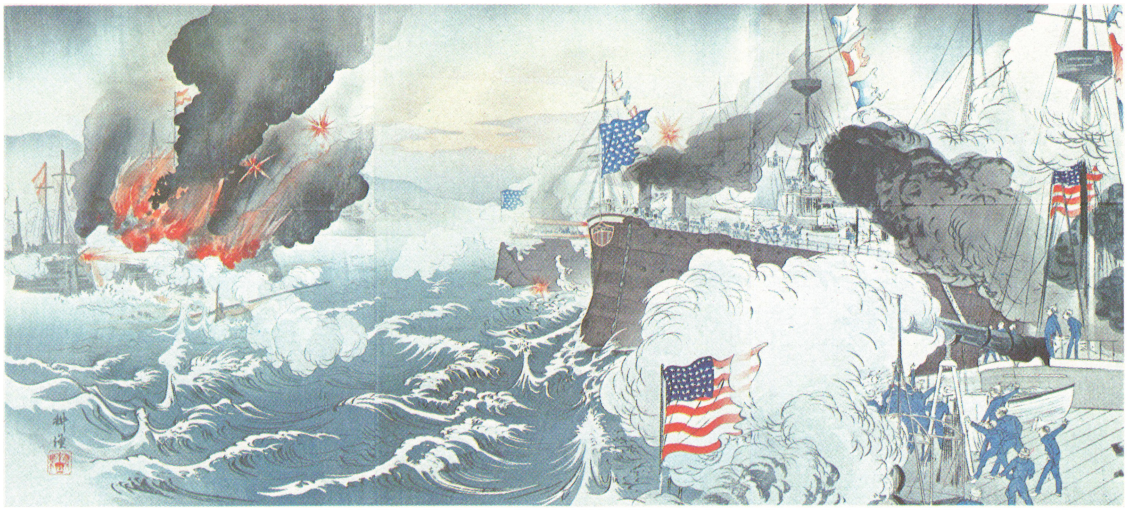
Republican William Howard Taft succeeded Roosevelt in 1909. Although a conservative, Taft helped further the cause of reform. He brought twice as many suits against businesses as Roosevelt did. He also extended civil service and called for a federal income tax.

In 1912, conservative Republicans backed Taft for their party's presidential nomination, and liberal Republicans supported Roosevelt. Taft won the nomination. The liberals then formed the Progressive, or "Bull Moose," Party and nominated Roosevelt for President. The Republican split enabled reform Democrat Woodrow Wilson to win the presidency. The Democrats also gained control of Congress.

The reform movement flourished under Wilson. Two amendments to the Constitution proposed during Taft's Administration were ratified in 1913. The 16th Amendment gave the federal government the power to levy an

Culver

The Progressive Era was marked by widespread demands for reform. Young socialist women, *left,* marched in a parade to demand better treatment of laborers. Such public demonstrations became common tactics among the reformers of the era.



Detail of *Battle of Manila Bay, May 1, 1898*, a lithograph by an unknown Japanese artist; Chicago Historical Society

Victory in the Spanish-American War set the United States on the road toward becoming a world power. The war lasted less than a year. In the Battle of Manila Bay, above, American ships commanded by Commodore George Dewey destroyed a Spanish fleet in the Philippines.

income tax. The 17th Amendment provided for the election of U.S. senators by the people, rather than by state legislatures. The Clayton Antitrust Act of 1914 struck a blow against monopolies. It prohibited corporations from grouping together under interlocking boards of directors. It also helped labor by making it impossible to prosecute unions under antitrust laws. In 1914, the government set up the Federal Trade Commission (FTC) to handle complaints about unfair business practices. The many other reform measures passed during Wilson's presidency included the Underwood Tariff Act of 1913, which lowered a high tariff that protected American business from foreign competition.

For more details on this era of reform in the United States, see PROGRESSIVE MOVEMENT.

Foreign Affairs

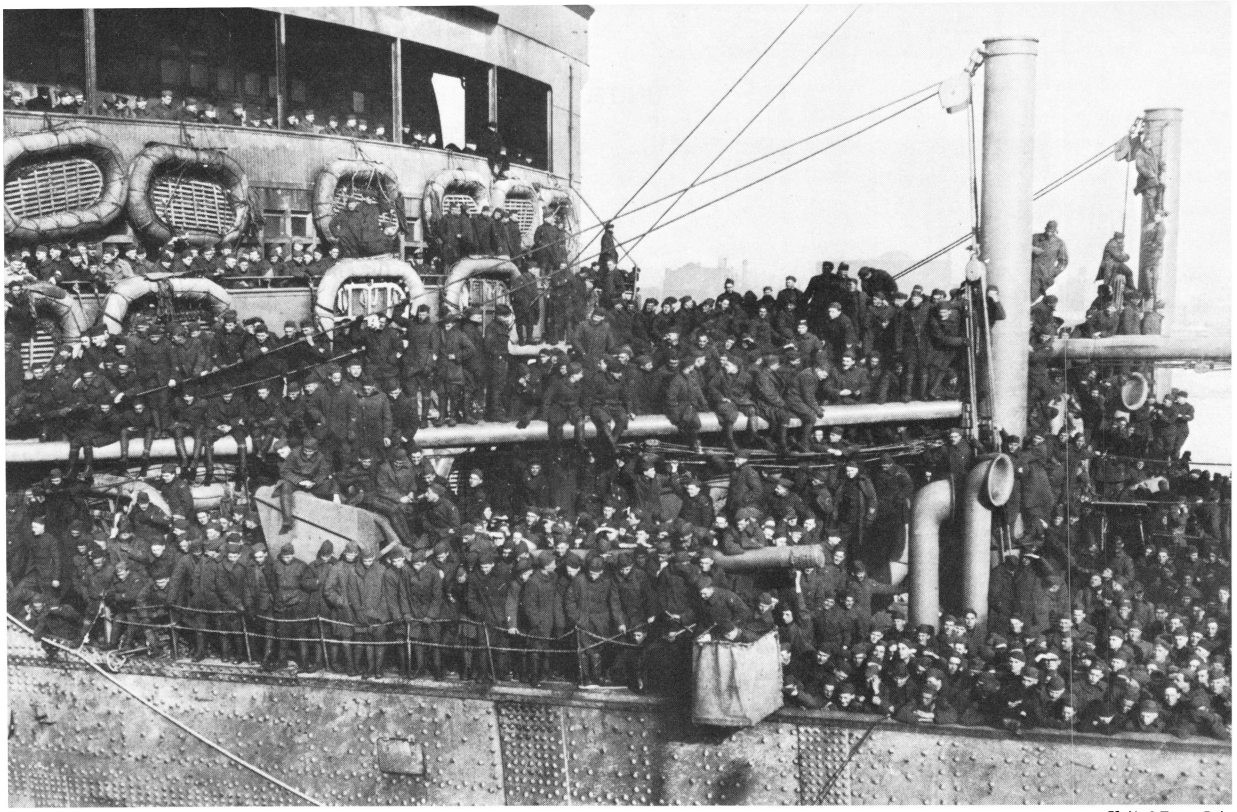
During the 1870's and 1880's, the United States paid relatively little attention to foreign affairs. In comparison to such European nations as France, Germany, and Great Britain, America was weak militarily and had little influence in international politics. Among Europeans, American diplomats had the reputation of being bumbling amateurs. German leader Otto von Bismarck summed up the European attitude toward America. He said, "A special Providence takes care of fools, drunkards, and the United States." During the 1890's and early 1900's, however, the United States developed into a world power and took a leading role in international affairs.

The Spanish-American War of 1898 marked a turning point in U.S. foreign policy. Spain ruled Cuba, Puerto Rico, the Philippines, and other overseas possessions during the 1890's. In the mid-1890's, Cubans revolted against their Spanish rulers. Many Americans demanded that the United States aid the rebels. On Feb. 15, 1898, the U.S. battleship *Maine* was blown up off the coast of Havana, Cuba. No one is certain who caused the explosion, but many Americans blamed the Spaniards. Demands for action against Spain grew, and "Remember the *Maine*" became a nationwide war cry. On April 25, 1898, at the request of President William McKinley, Congress declared war on Spain. The United States quickly defeated Spain, and the Treaty of Paris of Dec. 10, 1898, officially ended the war. Under it, the United States received Guam, Puerto Rico, and the Philippines from Spain. Also in 1898, the United States annexed Hawaii. See SPANISH-AMERICAN WAR; HAWAII (History).

A World Power. Roosevelt succeeded McKinley as President in 1901. He expressed his foreign policy strategy with the slogan, "Speak Softly and Carry a Big Stick." Roosevelt meant that the country must back up its diplomatic efforts with military strength.

The United States built up its armed forces under Roosevelt. In 1902, Germany, Great Britain, and Italy blockaded Venezuela in an attempt to collect debts from that South American nation. Citing the Monroe Doctrine, Roosevelt forced the Europeans to withdraw. In 1903, the President used a threat of force to gain the right to dig the Panama Canal (see PANAMA CANAL [History]). America took over the finances of the Dominican Republic in 1905 to keep that country stable and free from European intervention. In 1916, during Wilson's Administration, American troops occupied the Dominican Republic to keep order there. These and other actions showed that the United States had emerged as a world power.

War Clouds in Europe. In 1914, long-standing problems among European nations led to the outbreak of World War I. In this fierce, destructive struggle, the *Central Powers* (Germany and a few other nations) lined up against the *Allies* (France, Great Britain, Italy, Russia, and many smaller countries). Before long, events would drag the United States into the war and test its new role as a world power.



United Press Int.

World War I marked the first time the United States had fought a full-scale war on foreign territory. In 1917 and 1918, troopships carried about 2 million American fighting men across the Atlantic to Europe. Called *doughboys*, the Americans helped the Allies defeat Germany.

UNITED STATES HISTORY: 1917-1929 / *A New Place in the World*

The United States stayed out of World War I until 1917. But then, German acts of aggression convinced President Wilson and most other Americans of the need to join the war against Germany in order to make the world "safe for democracy." For the first time in its history, the United States mobilized for a full-scale war on foreign territory. About 2 million American fighting men soon crossed the Atlantic in troopships. The *doughboys*, as the troops were called, played an important role in the Allied victory in 1918.

The decade following World War I brought sweeping changes to American life. The economy entered a period of spectacular—though uneven—growth. Spurred on by the good times and a desire to be "modern," large numbers of Americans adopted new attitudes and life styles. The booming economy and fast-paced life of the decade gave it the nickname of the *Roaring Twenties*. But the good times ended abruptly. In 1929, a stock-market crash triggered the worst and longest depression in America's history.

World War I and the Peace

The United States in the War. After World War I began in 1914, the United States repeatedly stated its position of neutrality. But increasingly, German acts of aggression brought America closer to joining the Allies. On May 7, 1915, a German submarine sank the British passenger ship *Lusitania*. The attack killed 1,198 people, including 128 American passengers. Wilson and other Americans bitterly protested this killing of defenseless civilians, and Germany agreed to stop such attacks.

Wilson won re-election in November, 1916, using the slogan, "He Kept Us Out of War." But four months later, German submarines began sinking American merchant ships. This and other acts of aggression led the U.S. to declare war on Germany on April 6, 1917.

The American people rallied around their government's decision to go to war. Almost 2 million men volunteered for service, and about 3 million were drafted. The doughboys fought valiantly in the trenches, forests, and fields of France and helped the battered Allies turn back a major German offensive. On the home front, the spirit of patriotism grew to a fever pitch. Americans willingly let the government take near full control of the economy for the good of the war effort. The people bought billions of dollars worth of Liberty Bonds to help pay the cost of the war. Movie stars, including Charlie Chaplin and Mary Pickford, toured the country to promote bond sales. Fiery patriotic songs such as George M. Cohan's "Over There" and "You're a Grand Old Flag" gave a lift to the spirits of the doughboys and the public alike.

World War I ended in an Allied victory with the signing of an armistice on Nov. 11, 1918. For a detailed account of the conflict, see World War I.

The Peace Conference and Treaty. In 1919, the Allies held the Paris Peace Conference to draw up the terms of the peace with Germany. Wilson viewed the conference as an opportunity to establish lasting peace among nations. He proposed a list of terms called the *Fourteen Points* to be used as a guide for the peace settlement. The terms included arms reductions and settlement of disputed territorial claims (see FOURTEEN POINTS). But the other leading Allies were chiefly interested in gaining territory and war payments from Germany. They adopted the Treaty of Versailles, which ignored almost all of Wilson's proposals. The treaty stripped Germany of its armed forces and much territory, and forced it to pay high war damages.

The Treaty of Versailles did make provision for one of Wilson's proposals—an association of nations (later called the League of Nations) that would work to maintain peace. But Wilson suffered a final blow to his peace plans when the United States Senate failed to ratify the Treaty of Versailles. Thus, the Senate rejected U.S. participation in the League of Nations. See VERSAILLES, TREATY OF; LEAGUE OF NATIONS; WILSON, WOODROW (Wilson's Second Administration).

Life During the Roaring Twenties

In many ways, the 1920's marked the point at which the United States began developing into the modern society it is today. During and after World War I, people continued to move from farms to cities in record numbers. The 1920 United States Census reported that, for the first time, a majority of Americans lived in urban areas. By the end of the Roaring Twenties, such features of modern life as the automobile, telephone, radio, and electric washing machine had become part of millions of American households. In 1927, aviation pioneer Charles A. Lindbergh helped launch the modern air age when he made the first solo flight across the Atlantic Ocean.

The role of American women changed dramatically during the 1920's. The 19th Amendment to the Constitution, which became law on Aug. 26, 1920, gave women the right to vote in all elections. In addition, many new opportunities for education and careers opened up to women during the decade.

Modern Life and Social Change. Developments of the 1920's broadened the experiences of millions of Americans. The mass movement to cities meant more people could enjoy such activities as movies, plays, and sporting events. Radio broadcasting began on a large scale during the 1920's. It brought news of the world and entertainment into millions of urban and rural homes. The automobile gave people a new way to get around—whether for business, or to see far-off places, or just for fun. Motion-picture theaters became part of almost every city and town during the 1920's. They became known as *dream palaces* because of their fancy design and the excitement and romance that movies provided for the public. The new role of women also changed society. Many women who found careers outside the home began thinking of themselves more as the equal of men, and less as housewives and mothers.

Change and Problems. The modern trends of the 1920's brought about problems as well as benefits. Many Americans had trouble adjusting to the impersonal, fast-paced life of cities. This disorientation led to a rise in juvenile delinquency, crime, and other antisocial behavior. The complex life in cities also tended to weaken the strong family ties that had always been part of American society. See CITY (City Problems [Social Problems]).

The 18th Amendment to the Constitution, called the prohibition amendment, caused unforeseen problems. It outlawed the sale of alcoholic beverages throughout the United States as of Jan. 16, 1920. Large numbers of otherwise law-abiding citizens considered prohibition a violation of their rights. They ignored the law and bought liquor provided by underworld gangs. The supplying of illegal liquor, called *bootlegging*, helped many gangs prosper. In addition, competition for control of the lucrative bootlegging business led to many gang wars. See PROHIBITION.

The Flaming Youth. In an effort to be modern, many young men and women of the Roaring Twenties adopted a life style that earned them the nickname of the *Flaming Youth*. Women began wearing radically new clothing styles. Short skirts, rolled-down stockings, and short "bobbed" hair replaced the full-length dresses and long hair of earlier days. Women who wore such clothes became known as *flappers*. The flappers and their *beaus* (boyfriends) enjoyed such new thrills as speeding around in automobiles. They—along with many of their elders—often visited supposedly secret

Period Facts in Brief

Presidents (with political parties and dates of service)

Woodrow Wilson, Democrat, 1913-1921
Warren G. Harding, Republican, 1921-1923
Calvin Coolidge, Republican, 1923-1929
Herbert C. Hoover, Republican, 1929-1933

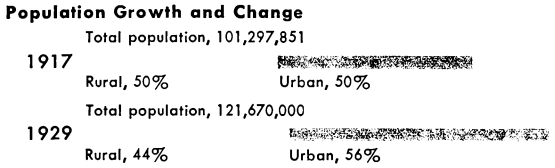
States in the Union

Number at start of period: 48
States added during the period: none.

Important Dates

1917-1918 The United States fought in World War I.
1920 The Senate rejected American participation in the League of Nations.
1920 The U.S. Census showed that, for the first time, the majority of Americans lived in urban areas.
1920 The 18th Amendment, prohibiting the sale of alcoholic beverages nationwide, became effective; the 19th Amendment gave women complete suffrage.
1922 The government raised tariffs to the highest level ever.
1925 The Scopes Trial in Dayton, Tenn., upheld the right of a state to ban the teaching of evolution in public schools.
c. 1925 The Golden Age of radio broadcasting began.
1927 Charles A. Lindbergh made the first solo flight across the Atlantic Ocean.
1927 *The Jazz Singer*, the first motion-picture "talkie," appeared.
1929 The stock-market crash brought financial ruin to thousands of investors.

Population Growth and Change



Ford Archives, Henry Ford Museum, Dearborn, Mich.

Automobile Ownership soared in the 1920's. During the decade, the number of automobiles in the United States nearly tripled. Cars soon crowded the streets of every American city and town.

Jazzmen Photo from Ramsey Archive

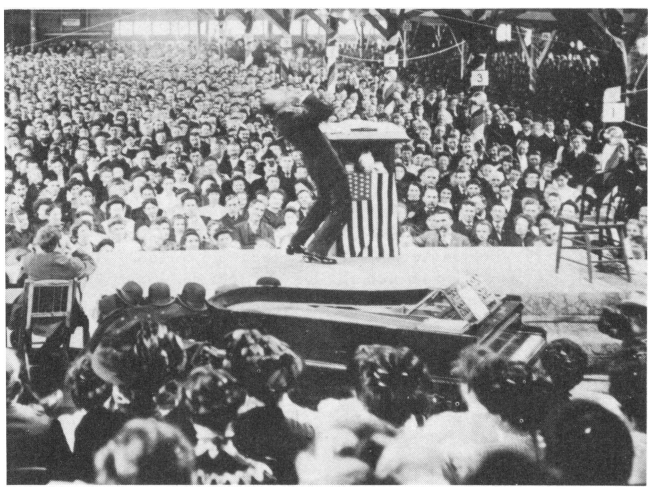
A Jazz Band and dancers dressed in flapper costumes entertain a nightclub audience, *above*. Jazz became so popular in the 1920's that the decade is sometimes called the *Jazz Age*.

nightclubs called *speakeasies*. At the speakeasies, people drank bootleg liquor; listened to jazz, the latest craze in popular music; and danced the Charleston and other modern steps.

An Age of Heroes. Americans of the Roaring Twenties developed strong admiration for individual accomplishment. Lindbergh's transatlantic flight made him a national hero. Sports superstars of the 1920's won the public's admiration for their ability to excel within the rules of the game. The stars included Red Grange of football, Jack Dempsey of boxing, Bobby Jones of golf, Bill Tilden and Helen Wills of tennis, and—most of all—baseball's Babe Ruth. Even attitudes toward big businessmen changed during the 1920's. Despised by many in earlier days, businessmen gained widespread admiration for their accomplishments.

The movies provided the public with daring fictional heroes, including good, strong cowboys who always defeated bad Indians or outlaws. In literature, F. Scott Fitzgerald created fictional characters whose pleasure-seeking lives won public admiration. But other authors saw little glamour in American life. For example, Sinclair Lewis won fame for novels that portrayed the "average American" as narrow-minded and dull. Ernest Hemingway scorned society's values and made heroes of the "lost generation"—people who did not fit into modern life.

Looking Backward. Not all Americans saw the changes brought about during the Roaring Twenties as being desirable. Many people yearned for a return to old American traditions, a trend that was reflected in many areas of life. In politics, it led to the return of a conservative federal government. In his successful presidential campaign of 1920, Warren G. Harding used the slogan "A Return to Normalcy." To many people, returning to "normalcy" meant ending the strong role of the federal government that marked the early 1900's. It also meant *isolation*, a turning away from the affairs of the outside world. Isolation—a reaction to World



Brown Bros.

Revival Meetings attracted large numbers of people during the 1920's. At these meetings, evangelists such as Billy Sunday, *on platform above*, delivered emotional sermons.

Wide World

Culver

Heroes of the 1920's included Babe Ruth and Charles A. Lindbergh. Ruth became the most famous sports star of the decade. Lindbergh made the first solo flight across the Atlantic Ocean.

War I—became a feature of American foreign policy during the 1920's.

In religion, the trend toward tradition led to an upsurge of *revivalism* (emotional religious preaching). Revival meetings were most common in rural areas, but also spread to cities. Billy Sunday, once a major-league baseball player, drew wildly enthusiastic crowds to his revivals in big cities.

The conservative Americans of the Roaring Twenties also called for a return to law and order. They denounced violations of prohibition and other crimes. However, few people seemed too bothered when, in 1923, investigators revealed widespread corruption in the Harding Administration (see HARDING, WARREN G. [Government Scandals]; TEAPOT DOME).

The Ku Klux Klan had died out in the 1870's, but a new Klan gained a large following during the 1920's. The new Klan had easy answers for Americans troubled by modern problems. It blamed the problems on "outsiders," including blacks, Jews, Roman Catholics, foreigners, and political radicals. Both Northerners and Southerners joined the Ku Klux Klan. At its height, the Klan had perhaps 5 million members. See KU KLUX KLAN (In the 1900's).

The Economy—Boom and Bust

During the 1920's, the American economy soared to spectacular heights. Wartime government restrictions on business ended. Conservatives gained control of the federal government and adopted policies that aided big business. New technological developments also contributed to business growth.

But in spite of its growth and apparent strength, the economy was on shaky grounds. Only one segment of the economy—manufacturing—prospered. The distribution of wealth grew lopsided. Businessmen grew rich, but farmers and laborers became worse off than before the war. Finally, in 1929, wild speculation led to a stock-market crash that toppled the economy like a house of cards.

Government and Business. The American people grew tired of the federal government's involvement in society that marked the Progressive Era and the war years. They elected to Congress conservatives who promised to reduce the role of government. Also, all three Presidents elected during the 1920's—Harding, Calvin Coolidge, and Herbert Hoover—were Republicans who agreed with the policy.

The federal government, however, did what it could to promote American business. In 1922, the government passed the Fordney-McCumber Act, which raised tariff duties to the highest level ever in order to keep foreign goods from competing with American products. This and other measures did much to help American business flourish.

Technology enabled American manufacturers to develop new products, improve existing ones, and turn out goods much faster and more cheaply than ever before. Sales of such items as electric washing machines, refrigerators, and radios soared. But the manufacturing boom depended most heavily on the growth of the automobile industry. Before and during the 1920's, Henry Ford and others refined car manufacturing to a science. The cost of automobiles continued to drop and sales soared. In just 10 years between 1920 and 1930, the number of cars registered in the United States almost tripled, growing from about 8 million to 23 million. The thriving automobile industry triggered growth in such related industries as steel, road construction, gasoline sales, and tourism.

Agriculture and Labor did not share in the prosperity. A reduced market for farm goods in war-torn Europe and a slowdown in the U.S. population growth led to a decline in the demand for American farm products. Organized labor suffered major setbacks during the 1920's. A lack of government support reduced the power of unions in their dealing with employers, and workers in many new industries remained unorganized. Widespread poverty among farmers and laborers cut into the demand for manufactured goods, a contributing factor to the upcoming depression.

Investments, Speculation, and the Crash. The economic growth of the 1920's led more Americans than ever to invest in the stocks of corporations. The investments, in turn, provided companies with a flood of new capital for business expansion. As investors poured money into the stock market, the value of stocks soared. The upsweep led to widespread speculation, which pushed the value of stocks far beyond the level justified by earnings and dividends. Much of the speculation involved buying stocks *on margin;* that is, paying a fraction of the cost and borrowing the rest.

Such unsound investment practices led to the stock-market crash of 1929. In late October, a decline in stock prices set in. Panic selling followed, lowering stock prices drastically and dragging investors to financial ruin. When the year ended, the government estimated that the crash had cost investors $40 billion. The crash combined with the other weaknesses in the economy to bring on the Great Depression of the 1930's.

For more details on the decade of the 1920's, see ROARING TWENTIES.

Wide World

The Stock-Market Crash of 1929 brought an abrupt end to the prosperity of the Roaring Twenties. Crowds of panic-stricken investors gathered aimlessly on Wall Street after the crash, above.

Brown Bros.

The Great Depression of the 1930's spread poverty throughout the United States. Hungry, unemployed Americans stood in long "bread lines" to receive food paid for by charitable donations. The hard times dragged on until 1942, after the United States entered World War II.

UNITED STATES HISTORY: 1930-1959/*Depression and a World in Conflict*

The United States suffered through the Great Depression that followed the stock-market crash of 1929 for more than 10 years. During the depression, millions of workers lost their jobs and large numbers of farmers were forced to abandon their farms. Poverty swept through the nation on a scale never before experienced.

The Great Depression was not limited to the United States. It struck almost every other country in the world. In some countries, the hard times helped bring to power dictators who promised action to restore the economy. The dictators included Adolf Hitler in Germany and a group of military leaders in Japan. Once in power, both Hitler and the Japanese rulers began conquering neighboring lands. Their actions led to World War II, the most destructive conflict in the history of man. The United States fought in the war from 1941 to 1945, and played a key role in defeating Germany and Japan.

Victory in World War II brought a spirit of great relief and joy to the United States. The postwar economy boomed. More people shared in the prosperity than ever before, creating a huge, well-to-do middle class. Even so, Americans still faced problems. Chief among them were the new threat of nuclear war, the growing strength of Communism, and discontent among Americans who did not share in the prosperity.

The Great Depression

The Road to Ruin. The stock-market crash sent shock waves through the American financial community. Banks greatly curtailed their loans to businesses, and businessmen then cut back on production. Millions of people lost their jobs because of the cutbacks. Spending then dwindled, and businesses suffered even more. Factories and stores shut down, causing even higher unemployment. Consumption of farm products declined, and farmers became worse off than ever. Thousands of banks failed during the depression and foreign trade decreased sharply. By the early 1930's, the nation's economy was paralyzed.

The Depression and the People. At the height of the depression in 1933, about 13 million Americans were out of work, and many others had only part-time jobs. Farm income declined so sharply that more than 750,000 farmers lost their land. The Dust Bowl, the result of a terrible drought on the western Great Plains, also wiped out many farmers (see DUST BOWL). Hundreds of thousands of people lost their life savings as a result of the bank failures.

Throughout the depression, many Americans went hungry. People stood in "bread lines" and went to "soup kitchens" to get food provided by charities. Often, two or more families lived crowded together in a small apartment. Some homeless people built shacks of tin and scraps of wood in vacant areas. They called these clumps of shacks *Hoovervilles*—a scornful reference to Herbert Hoover, President when the depression struck. In 1932, about 15,000 World War I veterans marched on Washington, D.C., to demand an early

payment of a government bonus owed them. Hoover ordered troops to drive them out of the city.

Roosevelt, Recovery, and Reform. Early in the Great Depression, Hoover promised that prosperity was "just around the corner." But the depression deepened as the election of 1932 approached. The Republicans slated Hoover for re-election. The Democrats chose Franklin Delano Roosevelt. In his campaign, Roosevelt promised government action to end the Great Depression and reforms to avoid future depressions. The people responded, and Roosevelt won a landslide victory.

Roosevelt's program for recovery and reform was called the *New Deal.* Its many provisions included public works projects to provide jobs, relief for farmers, aid to manufacturing firms, and the regulation of banks. A solidly Democratic Congress approved almost every measure Roosevelt proposed. Many new government agencies were set up to help fight the depression. The agencies included the Civilian Conservation Corps (CCC) and the Works Progress Administration (WPA), both of which provided jobs; the Farm Credit Administration (FCA), which extended credit to farmers; and the Social Security Board, which developed the social security system.

The New Deal helped relieve the hardship of many Americans. But hard times dragged on until World War II military spending stimulated the economy.

Roosevelt's efforts to end the depression made him one of the most popular U.S. Presidents. The voters elected him to four terms. No other President won election more than twice. Roosevelt's New Deal was a turning point in American history. It marked the start of a strong government role in the nation's economic affairs that has continued and grown to the present day. See GREAT DEPRESSION; NEW DEAL.

The United States in World War II

World War II began on Sept. 1, 1939, when German troops overran Poland. France, Great Britain, and other nations (called the Allies) went to war against Germany.

Period Facts in Brief

Presidents (with political parties and dates of service)

Herbert C. Hoover, Republican, 1929-1933
Franklin D. Roosevelt, Democrat, 1933-1945
Harry S. Truman, Democrat, 1945-1953
Dwight D. Eisenhower, Republican, 1953-1961

States in the Union

Number at start of period: 48
Number at end of period: 50
States added during the period:
Alaska (1959), Hawaii (1959).

Important Dates

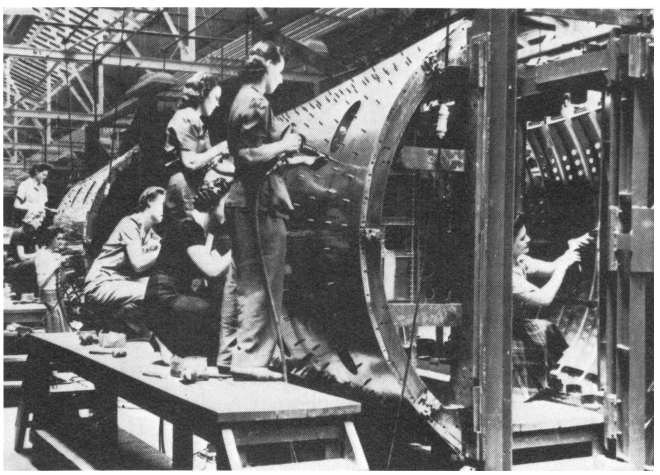
1930's The United States suffered through the Great Depression.
1933 President Franklin D. Roosevelt began the New Deal program to try to end the depression.
1941-1945 The United States fought in World War II.
1945 An American airplane dropped the first atomic bomb used in warfare on Hiroshima, Japan.
1945 The United States became a charter member of the United Nations (UN).
1947 President Truman announced the Truman Doctrine, which pledged American aid to nations threatened by Communism.
1950's Television became part of most American homes.
1950 Senator Joseph R. McCarthy gained national fame by charging that Communists had infiltrated the federal government.
1950-1953 The United States fought in the Korean War.
1954 The Supreme Court ruled compulsory segregation in public schools unconstitutional.
1955 Martin Luther King, Jr., began organizing a movement to protest discrimination against blacks.
1957 Russia launched *Sputnik I*—the first space satellite—causing the United States to place more emphasis on space research.

Population Growth and Change

1930 — Total population, 122,775,046; Rural, 44%; Urban, 56%
1959 — Total population, 175,608,490; Rural, 31%; Urban, 69%

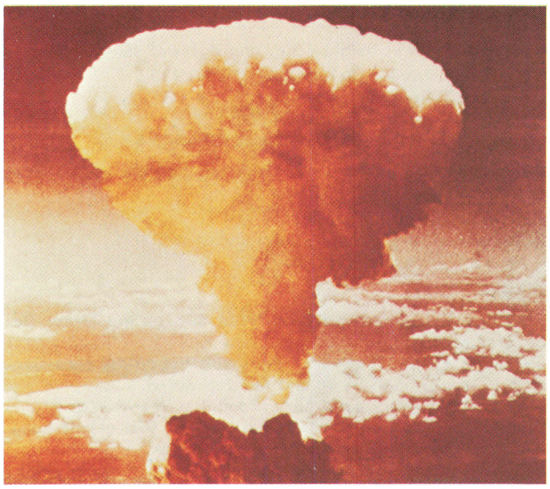
Library of Congress

The Dust Bowl spread across the Great Plains and the Southwest during the Depression, destroying much farmland. It was caused by a drought accompanied by severe dust storms.



Wide World

World War II Defense Workers included many women. The women filled jobs vacated by men who entered the armed forces. They helped supply the men with planes, ships, and weapons.



U.S. Energy Research and Development Administration

American Planes Dropped Atomic Bombs on the Japanese cities of Hiroshima and Nagasaki in 1945. The destruction from these blasts caused Japan to surrender, ending World War II.

At first, America stayed out of the war. But on Dec. 7, 1941, Japanese planes bombed the U.S. military base at Pearl Harbor, Hawaii. The United States declared war on Japan on December 8, and on Germany and Italy—Germany's chief ally—three days later.

The War Effort. The American people backed the war effort with fierce dedication. About 15 million American men served in the armed forces. They ranged from teenagers to men well over 40. More than 200,000 women volunteered for service. At home, automobile plants and other factories were converted into defense plants where airplanes, ships, weapons, and other war supplies were made. The country had a shortage of civilian men, and so thousands of women worked in the defense plants. With a combination of humor and admiration, people called the women defense workers "Rosie the Riveter." Even children took part in the war effort. Boys and girls collected used tin cans, old tires, and other "junk" that could be recycled and used for war supplies.

Allied Victory. On May 7, 1945, after a long, bitter struggle, the Americans and other Allies forced the mighty German war machine to surrender. Vice-President Harry S. Truman had become President upon Roosevelt's death about a month earlier. Truman demanded Japan's surrender, but the Japanese continued to fight on. Truman then made one of the major decisions in history. He ordered the use of the atomic bomb, a weapon many times more destructive than any previous weapon. An American airplane dropped the first atomic bomb used in warfare on Hiroshima, Japan, on Aug. 6, 1945. A second atomic bomb was dropped on Nagasaki on August 9 (see ATOMIC BOMB). Japan formally surrendered on September 2, and the war was over. For more details, see WORLD WAR II.

The Threat of Communism

The United States and Russia both fought on the side of the Allies during World War II. But after the war, the two countries became bitter enemies. Russia, as a Communist country, opposed democracy. It helped Communists take control of most of the countries of Eastern Europe and also aided Communists who seized control of China.

Russia and China then set out to spread Communism to other lands. The United States, as the world's most powerful democratic country, took on the role of defending non-Communist nations threatened by Communist take-over. The containment of Communism became the major goal of U.S. postwar foreign policy.

The Cold War and Foreign Policy. The postwar struggle between the American-led non-Communist nations and Russia and its Communist allies became known as the *Cold War*. It was so named because it did not lead to fighting, or a "hot" war, on a major scale.

Both the United States and Russia built up arsenals of atomic bombs, more powerful hydrogen bombs, and other nuclear weapons. The nuclear weapons made each nation capable of destroying the other. The threat of nuclear war made both sides cautious. As a result, Cold War strategy emphasized threats of force, propaganda, and aid to weak nations. The United Nations (UN), founded in 1945, provided a forum where the nations could try to settle their Cold War disputes.

Truman and Dwight D. Eisenhower, the first two Presidents of the Cold War era, pledged American military support to any nation threatened by Communism. Also, the United States provided billions of dollars to non-Communist nations. See COLD WAR.

The Korean War resulted from the Cold War friction. On June 25, 1950, troops from Communist North Korea, equipped by Russia, invaded South Korea. The UN called on member nations to help restore peace. Truman sent American troops to aid South Korea, and the UN sent a fighting force made up of troops from many nations. The war lasted for three years, ending in a truce on July 27, 1953. See KOREAN WAR.

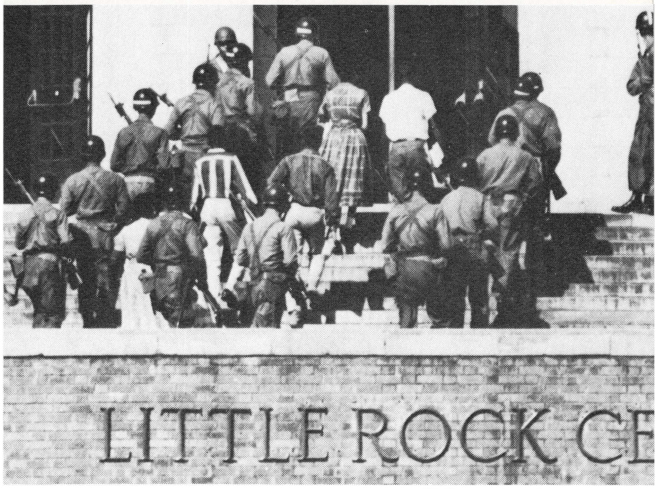
Communism and Internal Friction. The spread of Communism caused deep divisions within the United States. Conservatives blamed the Roosevelt and Truman Administrations for allowing the Communist postwar gains. They also claimed that Communists were infiltrating the American government. The charges led to widespread investigations of—and debate over—the extent of Communist influence in American government and society. Conservatives believed the investigations were needed to save the country from Communist control. Liberals charged the conservatives with conducting "witch hunts"; that is, trying to fix guilt on people without evidence. See UN-AMERICAN ACTIVITIES COMMITTEE; HISS, ALGER; MCCARTHY, JOSEPH R.

Postwar Society

After World War II, the United States entered the greatest period of economic growth in its history. Periods of *inflation* (rapidly rising prices) and *recession* (mild business slumps) occurred. But overall, businesses and people prospered. Prosperity spread to more Americans than ever before, resulting in major changes in American life. However, not all people shared in the prosperity. Millions of Americans—including a high percentage of the nation's blacks—continued to live in poverty. The existence of poverty amid prosperity

Cornell Capa, Magnum

Suburban Housing Developments sprang up around American cities after World War II. The postwar prosperity enabled millions of people to afford new houses in the suburbs.



United Press Int.

A Civil Rights Law banning compulsory school segregation led to a dramatic incident in 1957. President Eisenhower sent federal troops to escort black students into an all-white Arkansas school.

brought on a period of active social protest that has continued to the present day.

Prosperity Returns. Military spending during World War II drew the United States out of the Great Depression. Major industries, such as automobile manufacturing and housing construction, had all but stopped during the war. After the war, these industries resumed production on a much larger scale than ever. Relatively new industries such as electronics, plastics, frozen foods, and jet aircraft became booming businesses.

The shortage of goods during the war and other factors combined to create a vast market for American products. A soaring birth rate boosted the number of consumers. Between 1950 and 1960 alone, the population of the United States grew by about 28 million. Labor unions became stronger than ever, and gained high wages and other benefits for their members. Wage laws and other government regulations also helped give workers a greater share of the profits of business. These developments also meant that more Americans had more money to spend on goods.

A New Life Style resulted from the prosperity. After the war, millions of people needed, and were able to afford, new housing. Construction companies quickly built up huge clusters of houses in suburbs around the nation's cities. Vast numbers of Americans moved from cities to suburbs. The suburbs attracted people for many reasons. They offered newer housing, more open space, and—usually—better schools than the central cities. See SUBURB; CITY (Metropolitan Cities).

A rise in automobile ownership accompanied the suburban growth. The majority of suburbanites worked in the central cities and depended on cars to get to and from work. Most suburbs lacked good local transportation systems, and so families relied on cars to go shopping or almost anywhere else. Between 1940 and 1960, the number of automobiles registered in the United States jumped from about $27\frac{1}{2}$ million to $61\frac{1}{2}$ million. By 1960, over three-fourths of all American families owned a car, and almost a fifth owned more than one.

Increased automobile traffic led to the building of a nationwide network of superhighways. The car and prosperity enabled more people than ever to take vacation trips. New motels, fast-service restaurants, and gas stations sprang up to serve the tourists.

Prosperity and technological advances changed American life in other ways. Television—an experimental device before the war—became a feature of most American homes during the 1950's. This wonder of modern science brought scenes of the world into the American living room at the flick of a switch. Fascinated, large numbers of people made TV watching one of their main leisure-time activities (see TELEVISION [History]). New appliances made household work easier for American families. They included automatic washers, driers, dishwashers, and garbage disposers.

Poverty and Discrimination. In spite of the general prosperity, millions of Americans still lived in poverty. The poor included members of all races, but the plight of the nation's poor blacks seemed especially bleak. Ever since emancipation, blacks in both the North and South had faced discrimination in jobs, housing, education, and other areas. A lack of education and jobs made poverty among blacks widespread.

During the early 1900's, blacks, joined by many whites, had begun a movement to extend civil rights to blacks. The movement gained momentum after World War II. Efforts of civil rights leaders resulted in several Supreme Court decisions that attacked discrimination. In the best-known case, *Brown v. Board of Education of Topeka* (1954), the court ruled compulsory segregation in public schools illegal.

In spite of the gains, many civil rights leaders became dissatisfied with the slow progress of their movement. In 1955, Martin Luther King, Jr., a Baptist minister, began organizing demonstrations protesting discrimination. Before long, the public protest would become a major tool of Americans seeking change.

NASA

A Photograph of the Earth taken by astronauts orbiting the moon, *above*, is an example of America's leading role in science and technology. But despite its many accomplishments, the United States today faces a variety of problems and challenges—just as it has throughout its history.

UNITED STATES HISTORY/*America Since 1960*

The period of American history since 1960 has been marked by a continuation of many postwar trends. For much of the period, the country's foreign policy remained focused on the containment of Communism. The economy continued to expand, despite recurring periods of inflation and recession. The movement of people from cities to suburbs continued steadily. The 1970 U.S. Census showed that, for the first time, more Americans lived in suburbs than in cities.

The country continued to be a leader in scientific and technological advancements. It made great strides in medicine that helped reduce human suffering, and its technological skill provided the means for a new and exciting field of exploration—outer space.

At the same time, events and new public attitudes brought dramatic social changes to the United States. The black civil rights movement grew in intensity during the 1960's. Many other groups—including American Indians, Mexican Americans, and women—also began demanding fuller rights. In the mid-1960's, many Americans began challenging their government's foreign-policy decisions. Protesters of all kinds staged demonstrations to try to bring about change. Most demonstrations were conducted peacefully. But in some cases, they led to violence.

Crime and violence soared in the United States after 1960, and pollution threatened the environment. Concern over political corruption grew in the 1970's, and helped bring about the first resignation of an American President, Richard M. Nixon.

As in every other period of history, the list of the nation's problems was long. But at the same time, most Americans maintained a deep pride in their country. The many accomplishments of the American people throughout the nation's 200-year history gave hope for the future.

The 1960's

The Civil Rights Movement. The black civil rights movement became the main domestic issue in the United States during the early 1960's. Increasingly, blacks—joined by whites—staged demonstrations in order to dramatize their demands for rights and equality. One of the highlights of the movement came on Aug. 28, 1963, when more than 200,000 people staged a *freedom march* called the March on Washington in Washington, D.C.

John F. Kennedy, who became President in 1961, urged Congress to pass legislation outlawing discrimination on the basis of race. Kennedy was killed by an assassin on Nov. 22, 1963, and Vice-President Lyndon B. Johnson became President. Johnson, a former U.S. senator skilled in dealing with legislators, persuaded Congress to pass many major civil rights laws.

The Civil Rights Act of 1964 outlawed discrimination in employment, voter registration, and public accommodations. The Civil Rights Act of 1968 was designed to end discrimination in the sale and renting of housing. Congress, at Johnson's urging, also provided financial aid for the needy as part of a program that Johnson

called the War on Poverty. For a detailed account of the civil rights movement, see the NEGRO article.

Urban Unrest. In spite of government aid and a generally booming economy, poverty remained a major problem in America's central cities. Discontent among blacks in poor, decaying neighborhoods grew. In the mid-1960's, blacks staged riots in the ghettos of Chicago, Cleveland, Detroit, Los Angeles, New York City, Newark, and other cities. They also rioted in 1968, following the assassination of Martin Luther King, Jr.

The number of such crimes as murder, robbery, and rape soared during the 1960's. The crime rate was especially high in the central cities, but also increased rapidly in suburbs and elsewhere. Sociologists attributed the rising crime rate to many factors, including the weakening of the family, poverty, mental illness, drug addiction, and a feeling of hopelessness and alienation.

The Vietnam War brought further turmoil to the United States in the 1960's. The war had begun in 1957 as a battle for control of South Vietnam between the non-Communist government and Communists. In the late 1950's and early 1960's, Presidents Eisenhower and Kennedy sent military aid and advisers to support the South Vietnam government. Soon after Johnson became President, the Communists threatened to topple the government. Johnson responded to the threat by sending hundreds of thousands of American combat troops to help South Vietnam fight the Communists. By the mid-1960's, the United States was deeply involved in the Vietnam War.

Public response to the Vietnam War differed sharply from the near unanimous public support in World Wars I and II. A majority of Americans supported the war effort at first, but others bitterly opposed it. In the late 1960's, opposition to the war grew. The war critics argued that the United States had no right to interfere in Vietnamese affairs. Throughout the nation, college students and others staged demonstrations to protest America's involvement in Vietnam.

Wide World

Civil Rights for Blacks became a major national issue during the 1960's. About 200,000 persons, including both blacks and whites, took part in the March on Washington in 1963.

Johnson, discouraged by the criticism of his Vietnam policy, refused to run for re-election in 1968. The people elected Richard M. Nixon, partly because he pledged to end U.S. involvement in the war. But as the 1960's drew to a close, American troops were still fighting in Vietnam.

Space Exploration by American astronauts provided a high note during the troubled 1960's. On May 5, 1961, astronaut Alan B. Shepard soared into space from a launching pad at Cape Canaveral, Fla. Shepard earned the distinction of becoming the first American in space. Throughout the 1960's, the United States and Russia matched their technological skills in a race to land the first person on the moon. Then, on July 20, 1969, millions of people watched on television as U.S. astronaut Neil A. Armstrong climbed down from his spacecraft and became the first person to set foot on the moon. For the story of America's accomplishments in space, see SPACE TRAVEL.

Recent Developments

The Spreading Drive for Equality. The drive for equality that began with blacks spread to other minority groups. American Indians, Mexican Americans, and others organized active movements aimed at gaining equality (see INDIAN, AMERICAN [Indians Today]; MEXI-

Period Facts in Brief

Presidents (with political parties and dates of service)

Dwight D. Eisenhower, Republican, 1953-1961
John F. Kennedy, Democrat, 1961-1963
Lyndon B. Johnson, Democrat, 1963-1969
Richard M. Nixon, Republican, 1969-1974
Gerald R. Ford, Republican, 1974-

States in the Union

Number at start of period: 50
States added during the period: none.

Important Dates

1961 Astronaut Alan B. Shepard became the first American in space.
1962 Russia removed missiles from Cuba, ending a threat of war with the United States.
1963 More than 200,000 civil rights demonstrators staged the March on Washington in Washington, D.C.
1964 Congress passed a flood of important civil rights legislation.
1965 American combat troops began fighting in the Vietnam War.
1965 The first of a series of urban riots by blacks broke out in the Watts section of Los Angeles.
1969 Astronaut Neil A. Armstrong became the first person to set foot on the moon.
1973 The United States removed its last combat troops from Vietnam.
1974 Richard M. Nixon became the first American President to resign from office.
1976 The United States celebrated its bicentennial—the 200th anniversary of its founding.

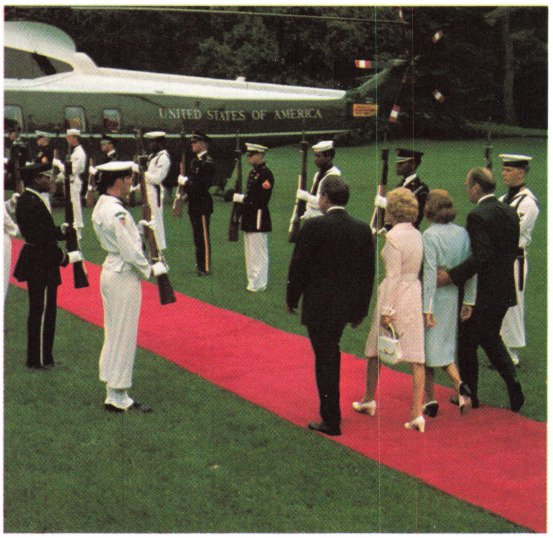
Population Growth and Change

1960
Total population, 179,323,175
Rural, 30% Urban, 70%

1976
Total population, 217,544,000
Rural, 24% Urban, 76%

David Burnett

Protest Demonstrations became a common tool among Americans seeking change in the 1960's. The young people above called for an end to U.S. participation in the Vietnam War.



Alex Webb, Magnum

The Watergate Scandal forced President Richard M. Nixon, *left on carpet,* to resign from office in 1974. Vice-President Gerald R. Ford, *right,* succeeded Nixon as President.

CAN AMERICANS). In addition, large numbers of women began calling for an end to discrimination based on sex. Their activities became known as the Women's Liberation Movement. The movement helped bring about greater equality for women in employment and other areas (see WOMAN [Woman's Roles Today]).

Pollution and Conservation. As the country's industry and population grew, so did the pollution of its environment. Smoke from factories and fumes from automobiles filled the air with dangerous gases. Wastes from factories and other sources polluted many rivers and lakes. In the late 1960's, large numbers of Americans began demanding government action to control environmental pollution. In response to these demands, the government passed many antipollution laws. But the pollution problem remains severe. See ENVIRONMENTAL POLLUTION.

The need to conserve energy has become another pressing problem for the country. America's many industries, households, cars, and other energy users place a drain on the nation's limited energy supply. The energy crisis was highlighted in 1973, when a fuel shortage reduced the supply of oil available for heating homes and the gasoline supply for automobiles and other vehicles. See ENERGY SUPPLY.

Foreign Policy. Nixon removed America's last combat troops from Vietnam in 1973—after he had won a second term as President. Two years later, in 1975, South Vietnam and neighboring Cambodia and Laos fell to the Communists. For fuller details on the conflict, see VIETNAM WAR.

As President, Nixon took steps to reduce the Cold War tensions between the United States and China and Russia, the two leading Communist powers. In 1972, he visited the two countries. Nixon reached agreements with the Chinese and Russian leaders that seemed to improve relations between the United States and the Communist powers, at least temporarily. The relaxing of tensions between the United States and the Communists came to be called *détente.*

Political Scandals rocked the United States in the 1970's. Investigators revealed many cases of graft and other corruption in local and state government, but the nation's attention focused chiefly on charges of corruption on the federal level.

In 1973, Spiro T. Agnew, Nixon's Vice-President, came under criminal investigation. A federal grand jury began hearing charges that he participated in widespread graft in Maryland. The investigation covered the period Agnew had served as an officeholder in Maryland and as Vice-President. Agnew resigned from the vice-presidency on Oct. 10, 1973. See AGNEW, SPIRO T.

In 1972, campaign workers for President Nixon's reelection committed a burglary at the Democratic political headquarters in the Watergate building complex in Washington, D.C. Nixon was later charged with covering up the burglary and with other illegal activities. In July, 1974, the Judiciary Committee of the House of Representatives voted articles of impeachment against the President. Evidence against Nixon mounted until it became apparent that the full House of Representatives would impeach him and that the Senate would remove him from office. On Aug. 9, 1974, Nixon resigned from the presidency. He was the only American President ever to resign.

Gerald R. Ford, who had been appointed Vice-President following Agnew's resignation, succeeded Nixon. He pardoned Nixon for all federal crimes the former President might have committed while in office. See WATERGATE and NIXON, RICHARD M., for more details on the Watergate scandal and resignation.

The Economy. In spite of its overall strength, the American economy ran into deep trouble during the late 1960's and early 1970's. The worst period of infla-

tion in the nation's history began in the late 1960's. During the early 1970's, a severe recession led to the country's highest unemployment rate since the Great Depression.

Historically, recessions have brought an end to inflation. In the 1970's, however, inflation continued in spite of the recession. This development left the nation's economic planners unsure as to how to deal with the problem. They knew that measures such as large tax cuts and increased government spending might help end the recession. But at the same time, they were aware that such measures could raise the rate of inflation.

America at the Bicentennial. In 1976, the American people celebrated the *bicentennial* (200th anniversary) of their nation's founding. They marked the occasion with parades, re-enactments of historical events, and other patriotic celebrations.

The bicentennial also provided a chance for a pause in the fast-paced life of the 1970's. As Americans looked back on their country's history, they saw that their forefathers had overcome great hardships and difficult problems. The examples of the past gave the people pride, and the hope that they and future Americans could do as well.

OSCAR HANDLIN

UNITED STATES HISTORY/*Study Aids*

Related Articles. WORLD BOOK has hundreds of separate articles that provide information on aspects of American history. See the articles on each President and the *History* section of the articles on each state. The many other related articles in WORLD BOOK include:

HISTORICAL PERIODS AND WARS

Civil War
Cold War
Colonial Life in America
Exploration and Discovery
French and Indian Wars
Gay Nineties
Gold Rush
Great Depression
Immigration and Emigration
Indian Wars
Industrial Revolution
Korean War
Mexican War
Pioneer Life in America
Progressive Movement
Reconstruction
Revolutionary War in America
Roaring Twenties
Spanish-American War
Vietnam War
War of 1812
Western Frontier Life
Westward Movement
World War I
World War II

IMPORTANT DOCUMENTS

Articles of Confederation
Atlantic Charter
Compromise of 1850
Constitution of the United States
Declaration of Independence
Emancipation Proclamation
Federalist, The
Four Freedoms
Fourteen Points
Gettysburg Address
Homestead Act
Kansas-Nebraska Act
Mayflower Compact
Missouri Compromise
Monroe Doctrine
Northwest Ordinance

OTHER RELATED ARTICLES

American Literature
Bicentennial Celebration, American
Continental Congress
Flag
Indian, American
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Slavery
Space Travel
States' Rights
Trails of Early Days
United States
United States, Government of the
United States Capitals

Outline

I. America Before Colonial Times
- A. The First Americans
- B. European Discovery
- C. Exploration and Early Settlement
- D. The Land That Became the United States

II. The Colonial Heritage (1607-1753)
- A. The Thirteen Colonies
- B. Life in Colonial America

III. The Movement for Independence (1754-1783)
- A. Background to the Revolution
- B. The Road to Independence
- C. American Attitudes and Independence

IV. Forming a New Nation (1784-1819)
- A. Establishing a Government
- B. Early Problems and Politics
- C. Jeffersonian Democracy
- D. The War of 1812
- E. Growing Nationalism

V. Expansion (1820-1849)
- A. America Moves West
- B. Politics and the "Common Man"
- C. Social Reform

VI. The Irrepressible Conflict (1850-1869)
- A. Debate and Compromise
- B. Nationwide Turmoil
- C. The Civil War and Reconstruction

VII. Industrialization and Reform (1870-1916)
- A. The Rise of Big Business
- B. The South and the West
- C. Life During the Industrial Era
- D. Reform
- E. Foreign Affairs

VIII. A New Place in the World (1917-1929)
- A. World War I and the Peace
- B. Life During the Roaring Twenties
- C. The Economy—Boom and Bust

IX. Depression and a World in Conflict (1930-1959)
- A. The Great Depression
- B. The United States in World War II
- C. The Threat of Communism
- D. Postwar Society

X. America Since 1960
- A. The 1960's
- B. Recent Developments

Questions

What were the 13 original colonies? When was the first permanent settlement in each colony made?

What was the Stamp Act? The Sugar Act? The Boston Tea Party? The Boston Massacre?

When was the Declaration of Independence adopted? What self-evident truths did it set forth?

Why did the early American leaders decide to write the Constitution?

What was the XYZ Affair? How did it help lead to the passage of the Alien and Sedition Acts?

What was the Louisiana Purchase? The Lewis and Clark Expedition?

When did the British capture Washington, D.C.?

What was the doctrine of manifest destiny? How did it affect American history?

How did westward expansion contribute to America's economic growth?

What was the nullification crisis?
Who were some of the leading abolitionists?
What was the role of the Mexican War in bringing on the Civil War?
What were some effects of the Civil War?
How did railroads contribute to the industrial boom of the 1800's?
How did the lives of the rich and the poor contrast during the era of industrialization?
What were some goals of the reformers of the late 1800's and early 1900's?
What was prohibition?
Whom did the nickname "Rosie the Riveter" describe?
What was the March on Washington?

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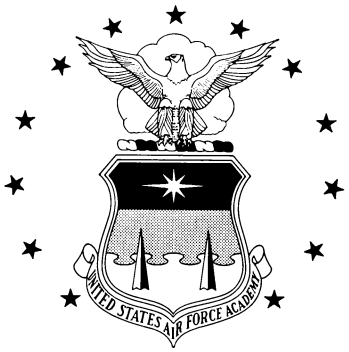
UNITED STATES AIR FORCE. See AIR FORCE, UNITED STATES.



Insigne of the United States Air Force Academy

UNITED STATES AIR FORCE ACADEMY prepares young men for careers as officers in the United States Air Force. It stands on an 18,000-acre (7,280-hectare) site in the foothills of the Rocky Mountains, near Colorado Springs, Colo. The academy is a separate operating agency of the Department of the Air Force.

Students at the academy are called *air force cadets.* Cadets take four years of academic work leading to a Bachelor of Science degree. They also take professional military training to earn regular commissions in the United States Air Force. When students enter the academy, they agree to serve four years as a cadet and five years as an air force officer.

The United States government provides food, housing, and medical care for the cadets. Each cadet receives a monthly salary to pay for uniforms, textbooks, and personal expenses.

Entrance Requirements. Candidates for appointment to the academy must be: (1) male citizens of the United States, (2) at least 17 and not yet 22 years old on July 1 of the year for which they seek appointment, (3) unmarried and never previously married, (4) in good physical condition, and (5) of good moral character. A catalog containing full information may be obtained from the Registrar, United States Air Force Academy, Colorado 80840.

Nomination and Selection of Cadets. Each candidate for the academy must be nominated by one of the legally established nominating sources. Candidates must then pass the qualifying medical examination, the physical aptitude examination, and college entrance examinations in order to qualify for appointment.

Cadet Life. Cadets live in a cadet dormitory. A cadet's normal weekday begins with *reveille* at 6 A.M. Before classes, they eat breakfast and prepare their rooms for morning inspection. Classes are held from 7:20 A.M. to 11:10 A.M. and from 12:35 P.M. to 3:25 P.M. Most classes are conducted in small classrooms and laboratories in Fairchild Hall.

After classes, the cadet takes part in sports, drill, or extracurricular activities. After supper, the cadet must study in the dormitory or in the academy library until 10:30 P.M. Taps sounds at 10:45 P.M.

Cadets may attend Sunday or Sabbath services of their faith in the academy chapel. The chapel's 17 towering aluminum spires make it an academy landmark. The chapel is divided into sections for Protestant,

Roman Catholic, and Jewish religious services. Cadets may also participate in services in nearby communities.

Cadets live by an *honor code* that stresses complete integrity in word and deed. The code says, "We will not lie, steal, or cheat, nor tolerate among us anyone who does." The cadets themselves enforce the code, and violation of the code is cause for dismissal.

Social functions for the cadets are held on weekends in Arnold Hall. Privileges to leave the campus on weekends increase as the cadet progresses through the academy. Each year, all cadets receive a 12-day Christmas *leave* (vacation), a 1-week spring leave, and a 3-week summer leave.

The Academy Curriculum consists of the academic program, military training, and physical education. The academic program includes courses in the basic and applied sciences, social sciences, and humanities. The cadet must take certain courses that provide a general background in all subject areas. The cadet also majors in one subject or area of concentration. Cadets who have completed previous college work and cadets with special ability may take graduate-level courses in their major fields. Cadets are also permitted to compete with students from other universities for fellowships and scholarships.

The academy prepares cadets for a role of leadership through military training. This training provides the basic military knowledge required of an air force officer. The training includes flying instruction and field trips. Each summer during their sophomore, junior, and senior years, cadets visit military installations and participate in training programs.

Cadets develop a high degree of physical fitness through a varied program of physical education and athletics. Each cadet must participate in either intramural or varsity athletic contests.

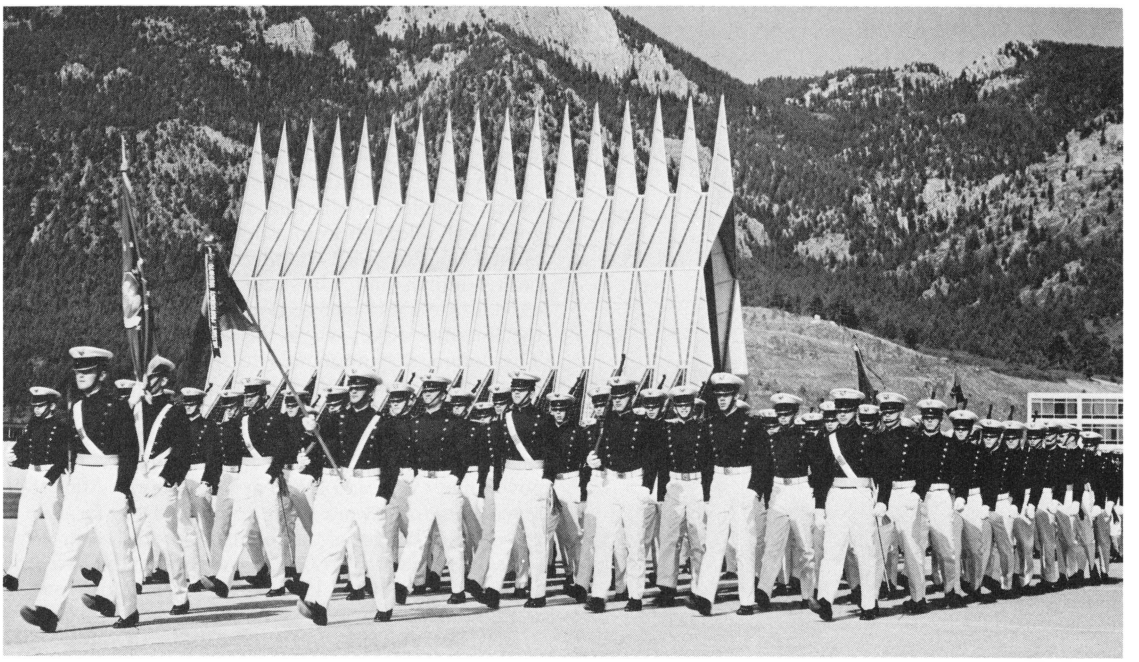
History. In the 1920's, Brigadier General Billy Mitchell urged that the government set up an air force academy (see MITCHELL, BILLY). In 1949, the Secretary of Defense appointed a service academy board to study

SELECTION OF CANDIDATES

Candidates for the United States Air Force Academy are nominated by the sources listed below. The figures represent the total number of candidates each nominating source may select for the Academy.

400	by the President of the United States
5	by the Vice-President of the United States
500	by United States Senators
2,175	by United States Congressmen
600	from qualified alternates selected by Senators and Congressmen
40	sons of deceased or disabled veterans
5	from the District of Columbia
6	from Puerto Rico
1	from the Canal Zone
1	from Guam
1	from Samoa
1	from the Virgin Islands
340	from the regular United States armed forces
340	from the reserve United States armed forces
80	from honor military schools
20	cadets from other countries

An unlimited number of sons of Medal of Honor winners may also attend.



U.S. Air Force

Air Force Cadets march past the cadet chapel on the campus of the U.S. Air Force Academy near Colorado Springs, Colo. The academy is located in the foothills of the Rocky Mountains.

U.S. Air Force

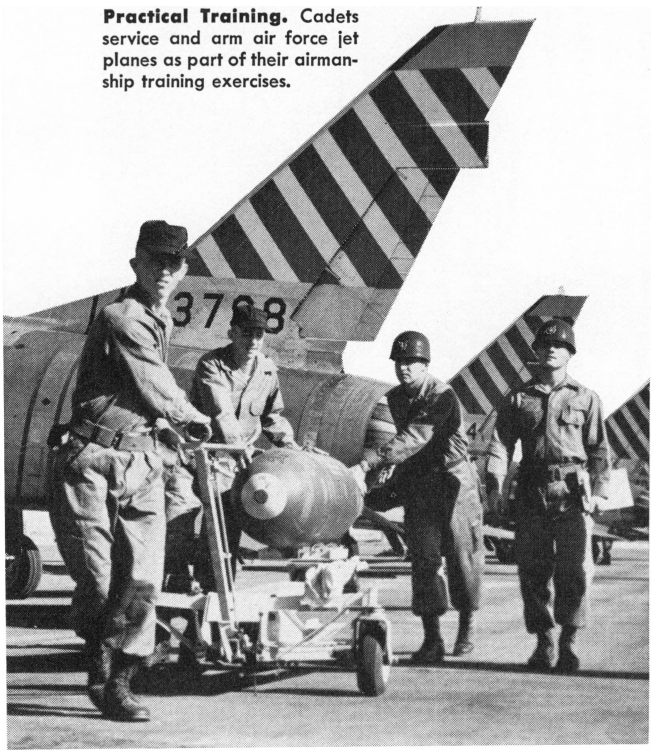
Academic Training. Air Force cadets receive personal help from the instructor in classes limited from 12 to 16 in number.

the need for another academy. The board recommended that an academy to train future air force officers be established without delay.

On April 1, 1954, Congress authorized the establishment of an air force academy. A site selection committee appointed by the Secretary of the Air Force chose the academy's permanent location. The air force dedicated the academy in 1955. Lt. Gen. Hubert R. Harmon became its first superintendent. The first class of 306 cadets trained at the temporary academy site at Lowry Air Force Base, near Denver, Colo. The academy moved to its permanent site near Colorado Springs in 1958. Critically reviewed by the AIR FORCE ACADEMY

UNITED STATES ARMY. See ARMY, UNITED STATES.

UNITED STATES BANK. See BANK OF THE UNITED STATES.



Practical Training. Cadets service and arm air force jet planes as part of their airmanship training exercises.

UNITED STATES BORDER PATROL. See BORDER PATROL, UNITED STATES.

UNITED STATES BOTANIC GARDEN in Washington, D.C., exhibits over 10,000 species and varieties of plants, many of them rare. The collection includes products of the United States and other countries. The garden is located on the southwest side of Capitol Hill.

As a public service, the garden identifies plants and recommends methods of growing them. It also presents special displays and furnishes educational facilities to botanists around the world.

A private organization founded the garden in 1820. In 1842, the government assumed control of the garden to display botanical collections assembled by government expeditions. The Congressional Joint Committee on the Library has supervised the United States Botanic Garden since 1856. JOHN C. BOLLENS

UNITED STATES CAPITALS. The federal government had no permanent capital from 1776, when the Declaration of Independence was signed, until 1800, when the government took up its residence in Washington, D.C. The Continental Congress, and, later, the Congress authorized under the Articles of Confederation, had many different meeting places. The capitals used by the earliest American Congresses are listed below, with the dates Congress met in each capital.

Philadelphia, September, 1774, to December, 1776.
Baltimore, December 20, 1776, to March, 1777.
Philadelphia, March 4, 1777, to September, 1777.
Lancaster, Pa., September 27, 1777.
York, Pa., September 30, 1777, to July, 1778.
Philadelphia, July 2, 1778, to June 30, 1783.
Princeton, N.J., June 30, 1783, to November 4, 1783.
Annapolis, Md., November 26, 1783, to November 1, 1784.
Trenton, N.J., November 1, 1784, to December 24, 1784.
New York City, January 11, 1785, to June, 1790.

In 1789, the United States Constitution authorized the new Congress to accept a gift of land from the states for the establishment of a new capital. But jealousy among the states blocked every attempt to choose a location. At last, Alexander Hamilton of New York agreed to the selection of Virginia as a site. In return, Congressional delegates from Virginia agreed to support a bill in Congress which Hamilton wanted passed. Finally, both Virginia and Maryland gave land for the new capital. President George Washington chose the site on the Potomac River where the capital was to be built. The commission appointed to survey the ground and plan the city named the capital *The City of Washington* in honor of the President.

The capital was built between 1790 and 1800. During this period, Congress met in Philadelphia. In 1800, the government was established at Washington. After 1801, several attempts were made to change the location of the capital, but all of them failed. GEORGE E. MOWRY

See also UNITED STATES, GOVERNMENT OF THE (pictures, Capitols of the United States); DISTRICT OF COLUMBIA; WASHINGTON, D.C.

UNITED STATES CIVIL SERVICE COMMISSION. See CIVIL SERVICE COMMISSION, UNITED STATES.

UNITED STATES COAST GUARD. See COAST GUARD, UNITED STATES.

UNITED STATES COAST GUARD ACADEMY prepares young men to be commissioned officers in the United States Coast Guard. It covers 100 acres (48 hectares) on the banks of the Thames River in New London, Conn. The academy is comparable to those of the other armed forces. But its enrollment is smaller and entrance is by annual nationwide competitive test rather than by congressional appointment.

Students at the academy are called *cadets*. Graduates receive bachelor of science degrees and commissions as ensigns in the United States Coast Guard.

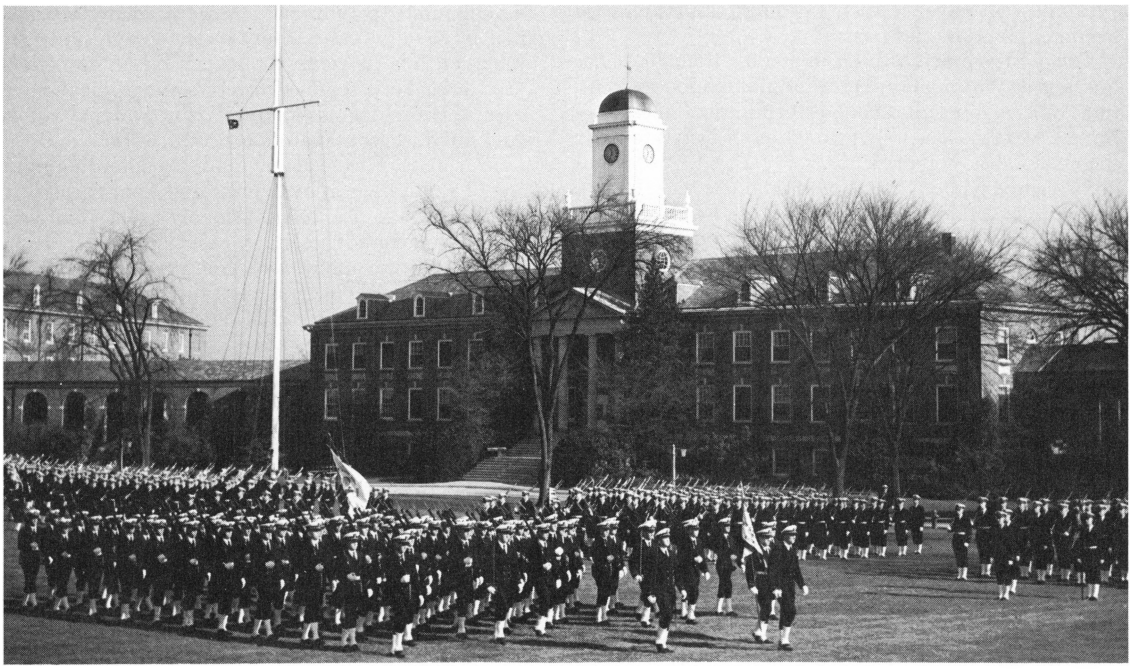
Entrance Requirements. Cadets are selected through nationwide competition based on college entrance examinations. An applicant must be a male U.S. citizen at least 17, but not yet 22, years of age. He must also meet other requirements established by the commandant of the United States Coast Guard.

The academy has an enrollment of about 1,100 students. Cadets are organized as a brigade for military training. Senior cadets serve as brigade officers under the supervision of career Coast Guard officers.

The Course of Instruction offers a four-year program of academic, military, and physical education training. A cadet must take certain courses that provide a background in all subject areas. He also chooses one of 13 fields for in-depth study. Such fields include marine engineering and ocean science. Military training includes such academic courses as navigation and seamanship, plus summer training. During summers, cadets participate in Coast Guard operations aboard modern cutters and the academy's training bark *Eagle*. Summer programs include aviation training, small arms training, and search-and-rescue training.

Navigation Training for Coast Guard Academy cadets includes learning how to use a sextant quickly and accurately, *below*. The academy seal is shown at the left.

U.S. Coast Guard



U.S. Coast Guard

Coast Guard Academy Cadets pass in review on the campus at New London, Conn. Hamilton Hall, the academy's administration building, faces the parade ground.

History. The Coast Guard cadet training system began in 1876 with the assignment of the cutter *Dobbin* as a combination training ship, classroom, and berthing quarters. Cadets had their winter quarters at New Bedford, Mass., and later at Arundel Cove, Md. In 1910, the Coast Guard established the academy on shore at New London. The original Georgian-style buildings were built in 1932. Today, more than 30 buildings make up the academy. Critically reviewed by the COAST GUARD ACADEMY

See also COAST GUARD, UNITED STATES (Training an Officer); CONNECTICUT (picture: Parading).

UNITED STATES CONGRESS. See CONGRESS OF THE UNITED STATES.

UNITED STATES CONSTITUTION. See CONSTITUTION OF THE UNITED STATES.

UNITED STATES DEPARTMENT. Each executive department of the U.S. government has an article in WORLD BOOK. For a list of the departments, see the CABINET article.

UNITED STATES EMPLOYMENT SERVICE. See EMPLOYMENT SERVICE, UNITED STATES.

UNITED STATES FLAG. See FLAG.

UNITED STATES FOREST SERVICE. See FOREST AND FOREST PRODUCTS (Careers); FOREST SERVICE.

UNITED STATES GOVERNMENT. See UNITED STATES, GOVERNMENT OF THE.

UNITED STATES HISTORY. See UNITED STATES, HISTORY OF THE.

UNITED STATES INFORMATION AGENCY (USIA) distributes to persons in other countries information about the United States, its culture, its policies, and American life in general. The USIA works to "submit evidence to peoples of other nations . . . that the objectives and policies of the United States are in harmony with and will advance their legitimate aspirations for freedom, progress, and peace."

The USIA provides basic materials from its headquarters in Washington, D.C., for information and cultural officers to use in about 100 countries. These officers carry on various USIA programs designed to meet the needs of the countries they serve in. USIA operates abroad as the United States Information Service (USIS).

A public affairs officer directs each overseas information post. He works under the United States ambassador to that country. The information he provides reflects official American foreign policy. But each officer abroad may use techniques best suited to reach the people of the country in which he works.

The USIA staff employs such communications methods as newspapers, magazines, pamphlets, lectures, films, television, and radio to present a true picture of the United States to other countries. One of the best-known means of communication is the Voice of America, which broadcasts news, discussions, and music to all parts of the world (see VOICE OF AMERICA).

The USIA was established in 1953. It took over work that had been carried on by the Office of War Information during World War II, and then by the Department of State. Its 11,000 employees include about 1,500 Americans overseas and 6,200 local employees in the countries served.

Critically reviewed by the UNITED STATES INFORMATION AGENCY

See also LIBRARY (U.S. Government Libraries).

UNITED STATES MARINE CORPS. See MARINE CORPS, UNITED STATES.

UNITED STATES MARINE CORPS WAR MEMORIAL. See WASHINGTON, D.C. (color picture); IWO JIMA.

UNITED STATES MERCHANT MARINE ACADEMY trains young men and women to become officers in the United States Merchant Marine. The academy, often called *Kings Point*, occupies 65 acres (26 hectares) on the north shore of Long Island at Kings Point, N.Y., about 20 miles (32 kilometers) northeast of New York City.

The United States Merchant Marine Cadet Corps was established in 1938. Its academy, founded in 1942, became a permanent, government-sponsored school in 1956, and received equal status with the academies of the armed forces. The Maritime Administration, an agency of the United States Department of Commerce, operates the academy.

U.S. Merchant Marine Academy
Cadet Corps Insignia

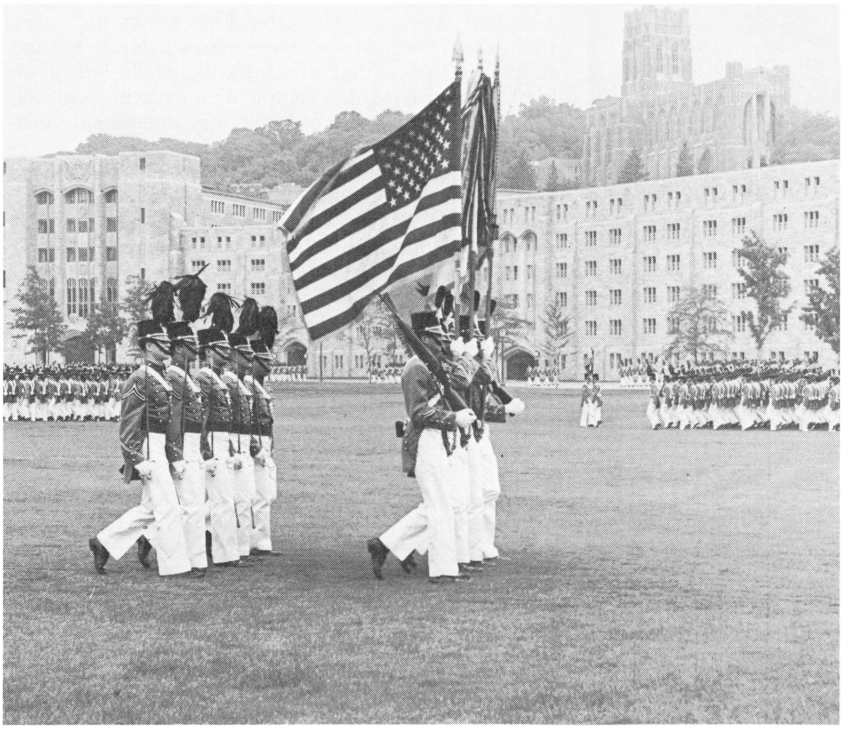
Entrance Requirements. Candidates for the school must be unmarried citizens of the United States, not less than 17 and not yet 22 years of age by July 1 of the year in which they seek admission. They must be of good moral character. They must also have 15 high school credits, including 3 units in mathematics, 1 unit in science, and 3 units in English. Competitive examinations are held each year among candidates nominated by United States senators or representatives. In 1974, the academy accepted women students for the first time.

Enrollment. Appointments to the academy are governed by a state and territory quota system based on population. The academy has an authorized strength of 900 cadets. They represent every state of the United States, the District of Columbia, the Panama Canal Zone, Puerto Rico, Guam, American Samoa, and the Virgin Islands. The academy may also admit not more than 12 candidates from Central and South America.

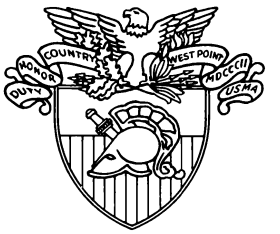
The School Program. The academy offers a four-year course of undergraduate study designed to prepare its graduates for the many problems that may confront merchant marine officers during their careers. Cadets study and gain practical experience in an atmosphere of order and discipline. Their practical experience subjects include training aboard a ship. Their academic subjects deal with such fields as marine engineering, navigation, electricity, ship construction, naval science and tactics, economics, business, languages, and history.

The cadets spend their first year as Fourth Classmen at the academy. Their second year, as Third Classmen, is spent aboard a merchant ship. Their third year, as Second Classmen, and fourth year, as First Classmen, are both spent at the academy.

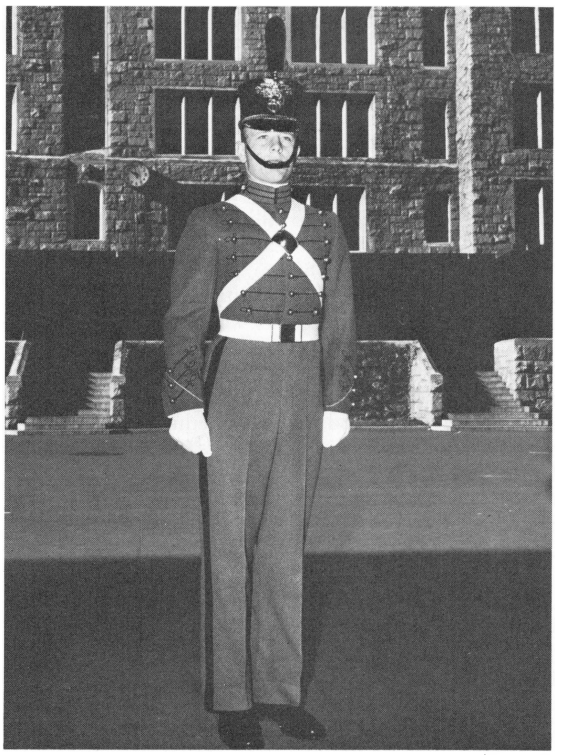
On completion of the four-year program, cadets are examined for their original licenses as third deck, or engineering, officers in the merchant marine. They may then serve on any U.S. Merchant Marine ship. Graduates also receive bachelor's degrees and commissions as ensigns in the naval reserve. GORDON MCLINTOCK



U.S. Army



The U.S. Military Academy at West Point, N.Y., prepares young men for a career as a military officer. Washington Hall, *left,* is the center of many cadet activities at the academy. The main parade ground, called *The Plain,* lies in front of the hall. The academy's official seal is shown above.



U.S. Army

A Cadet undergoes a four-year training program that leads to a Bachelor of Science degree and a commission in the Army.

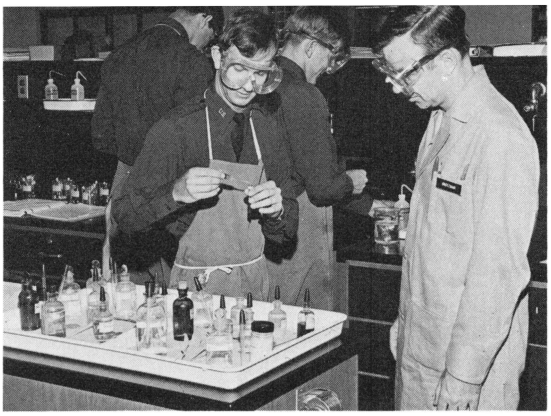
UNITED STATES MILITARY ACADEMY at West Point, N.Y., is the oldest military college in the United States. It prepares young men for careers as military officers. The academy is supported by the federal government, and is supervised by the Department of the Army.

Students at the academy are called *cadets*. After four years of training, they earn Bachelor of Science degrees and they receive commissions in the United States Army.

The academy is part of a military reservation that occupies 16,000 acres (6,470 hectares) on the west bank of the Hudson River, about 50 miles (80 kilometers) north of New York City. The superintendent, an Army lieutenant general, commands the academy and the military post associated with it.

Entrance Requirements. A candidate for the school must be at least 17 years old, and not older than 21, on July 1 of the year of admission. A candidate must never have been married, and must be a U.S. citizen and a high school graduate. The Director of Admissions and Registrar, United States Military Academy, West Point, N.Y. 10996, provides information on admissions.

A candidate must obtain a nomination to the academy before taking the academic, physical aptitude, and medical examinations. About three-fourths of the vacancies for the academy are filled by nominees of U.S. Senators and Representatives. In addition, qualified members of the regular or reserve components of the armed forces may be nominated under separate quotas. Other candidates may receive nominations from the President or Vice-President. Quotas also have been



U.S. Army

Students at West Point take many courses in science and technology. Laboratory sessions form an important part of such courses as chemistry, *above*. Students also participate in such extracurricular activities as working at the cadet radio station, *below*.

U.S. Army

established for sons of deceased or disabled veterans, and for certain other categories.

Cadets are members of the Regular Army. They are paid about $280 a month. From this amount, they must pay for uniforms, textbooks, and incidental expenses. Housing, meals, and medical care are provided.

SELECTION OF CANDIDATES

Candidates for the United States Military Academy are appointed as follows. The figures represent the total number of candidates each nominating source may select for the academy.

400	by the President of the United States
5	by the Vice-President of the United States
500	by United States Senators
2,175	by United States Representatives
600	from qualified alternates selected by Senators and Congressmen
40	sons of deceased or disabled veterans
5	from the District of Columbia
6	from Puerto Rico
1	from the Canal Zone
1	from Guam
1	from Samoa
1	from the Virgin Islands
340	from the regular United States armed forces
340	from the reserve United States armed forces
80	from honor military schools
20	cadets from other countries

An unlimited number of sons of Medal of Honor winners may also attend.

The Student Body is called the Corps of Cadets. The corps is broken down into regiments, battalions, and companies. The academy's *honor code* is a cherished possession of cadets and graduates. Enforced by the cadets themselves, the code has never outgrown its original and simple meaning—that a cadet will not lie, cheat, or steal. The code requires complete integrity in word and deed. It is strictly enforced, and any intentional violation is a cause for dismissal from the academy.

The cadet academic year extends from September to June. *June Week* climaxes the year's events for the graduating *First* (senior) class. Other classes are called the *Fourth* (freshman) class; *Third* (sophomore) class; and *Second* (junior) class.

A Cadet's Day starts with the first call for reveille at 6:10 A.M. All cadets live in barracks, two to a room. They eat their meals in Washington Hall. Classes and study time extend from 7:40 A.M. until 3:15 P.M. From that time until the 6:15 P.M. supper hour, cadets participate in extracurricular activities, parades, or intramural and intercollegiate athletics. The day ends with taps at 11 P.M.

Education and Training. The four-year undergraduate program at the academy seeks to prepare students for service as professional army officers. It stresses academic, military, and physical fitness skills. The academic curriculum provides a basic education in the fields of engineering, mathematics, science, and the social sciences and humanities. Advanced and elective courses enable cadets to concentrate in areas of particular interest.

The cadet receives training in military skills through participation in the Corps of Cadets, through courses taken during the academic year, and through summer training sessions. Summer training is held at West Point, at nearby Fort Buckner, or at selected military posts. It includes instruction in Army weapons and field maneuvers. A cadet also spends time as a platoon leader with an actual Army combat unit. Students develop physical fitness skills through required participation in varsity or intramural sports.

History. The idea of a military academy was first proposed in the late 1700's by such early American leaders as George Washington. In March, 1802, Congress established the U.S. Military Academy on an Army site at West Point, N.Y. The school opened officially in July of the same year. Under Col. Sylvanus Thayer, who served as superintendent from 1817 to 1833, the academy became a pioneer in civil engineering. Thayer also introduced many educational reforms that remain important ingredients of academy life. During the Civil War (1861-1865), the school dropped its strict emphasis on engineering. Today, the academy provides a broad educational background, plus specialized and elective programs.

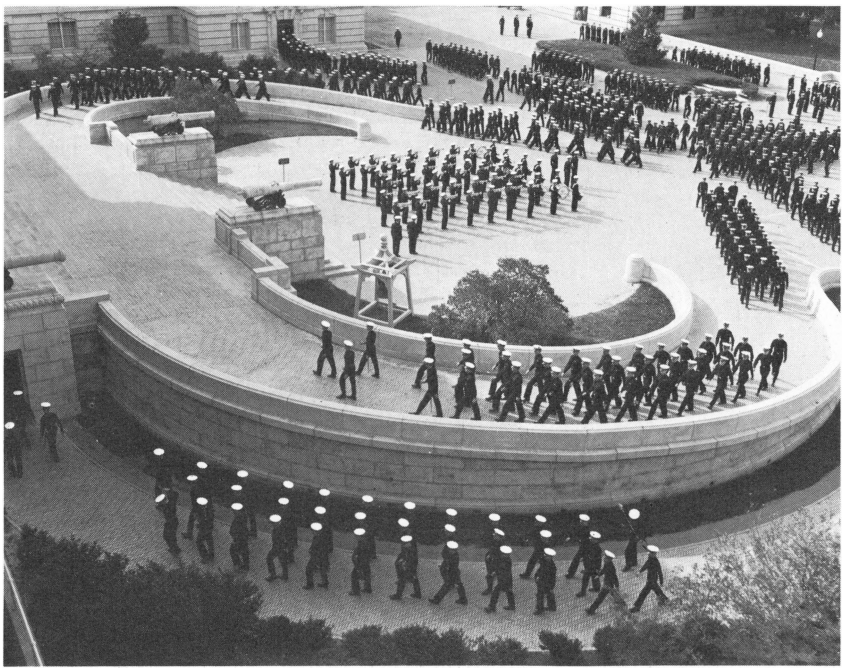
Among the great American military leaders who received their training at West Point were Robert E. Lee, Ulysses S. Grant, Stonewall Jackson, Philip Sheridan, John J. Pershing, Douglas MacArthur, Dwight D. Eisenhower, and George S. Patton, Jr.

Critically reviewed by UNITED STATES MILITARY ACADEMY

See also NEW YORK (picture); THAYER, SYLVANUS.

UNITED STATES NATIONAL MUSEUM. See NATIONAL MUSEUM OF HISTORY AND TECHNOLOGY; NATIONAL MUSEUM OF NATURAL HISTORY.

UNITED STATES NAVAL ACADEMY



U.S. Navy

Precision Drill gives midshipmen a chance to display their ability at marching in complicated formations. The United States Naval Academy band takes part in the elaborate performances. The academy coat of arms is shown above.

UNITED STATES NAVAL ACADEMY at Annapolis, Md., is a government-operated military college that educates and trains young men to become officers in the United States Navy and Marine Corps. The academy and adjacent naval activities occupy about 1,100 acres (449 hectares) on the banks of the Severn River. George Bancroft, secretary of the navy under President James K. Polk, founded the academy in 1845.

Students at the Naval Academy are called *midshipmen*. Their training takes four years. Those who complete the work are awarded a bachelor of science degree, and are commissioned as ensigns in the Navy or as second lieutenants in the Marine Corps.

Entrance Requirements. Each year, about 1,300 young men are selected for admission to the *plebe* (freshman) class at the Naval Academy. A candidate for the school must be at least 17 years old, and not older than 21, on July 1 of the year of admission. A candidate must never have been married, and must be a U S. citizen and a high school graduate.

To be considered for an appointment to the academy, a candidate must obtain a nomination from an official source. Such sources include U.S. senators and representatives, the President, and the secretary of the navy. Most candidates apply for nomination during the spring of their junior year in high school because some congressmen select their nominees the following summer.

An admissions board at the academy examines each candidate's school records and college entrance examination scores. The board also studies the results of a candidate's medical and physical aptitude tests and other evidence of character, leadership potential, academic aptitude, and physical fitness. Most young men who are accepted for admission to the academy rank academically in the top 20 per cent of their high school class.

After the midshipmen have been admitted, the U.S. government pays for their tuition, room and board, and medical and dental care. Each midshipman is paid about $280 a month, which is one-half the pay of an ensign. Midshipmen must use this salary to pay for books, uniforms, equipment, and laundry service. After these expenses are deducted, they usually have a remaining cash allowance of $40 to $50 each month. They receive an increased allowance for leave periods and other special occasions.

Complete information about entering the academy can be obtained by writing the Director of Candidate Guidance, United States Naval Academy, Annapolis, Md. 21402.

SELECTION OF CANDIDATES

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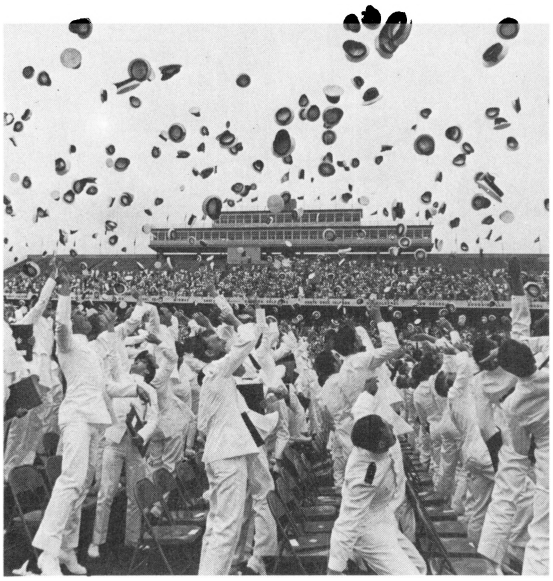


U.S. Navy

Naval Academy Graduates celebrate the end of four years of training by tossing their caps high in the air. Graduates are commissioned as ensigns in the Navy or as second lieutenants in the Marine Corps.

The Life of a Midshipman. The program at Annapolis seeks to develop students for positions of military leadership. The academy emphasizes both academic training and the development of leadership, physical, and professional skills. During the academic year, midshipmen devote their major efforts to academic studies. But they also must participate in a varsity sport or in the intramural sports program. The Army-Navy football game between the U.S. Military Academy at West Point, N.Y., and the U.S. Naval Academy ranks as the biggest sports event of the year. For extracurricular activity, students choose from more than 65 clubs and organizations, ranging from dramatics to scuba diving.

During the midshipmen's first summer, they learn the fundamentals of military life, including how to shoot and sail. Physical tests, drills, and athletics are required for physical fitness. During their remaining summers, the midshipmen spend time at sea and at naval installations learning about ships, submarines, and aircraft.

Graduates receive their diplomas and Navy or Marine Corps commissions at the end of June Week. They celebrate by tossing their midshipmen caps high in the air. One of the academy songs, "Anchors Aweigh," was composed for the June Week of 1907.

The Academic Program. The Naval Academy offers a four-year undergraduate program. The curriculum provides a liberal education in mathematics, science, and the social sciences and humanities. It also supplies a background in seamanship, engineering, navigation, and weaponry. Each midshipman follows a specialized program that provides in-depth study in a field of interest. Such fields include aerospace engineering, oceanography, and international security affairs.

History. Midshipmen were trained at sea before the academy was founded as the Naval School in 1845. George Bancroft established the school in Annapolis on the site of Fort Severn, a former U.S. Army post. In 1850 and 1851, the school was reorganized as the U.S. Naval Academy. During the Civil War (1861-1865), Annapolis was considered too close to the battle lines, so the midshipmen were moved to Newport, R.I. In 1865, midshipmen returned to Annapolis. At about the same time, the academy began adding athletics and more recreation to the program.

The Spanish-American War, in 1898, demonstrated the school's importance to the Navy, and the course of study was greatly expanded. New buildings were constructed between 1899 and 1907, and most of them are still used. Fort Severn and many other landmarks were torn down to make room for the new structures. Another large building program was underway in the early 1970's. Critically reviewed by the U.S. NAVAL ACADEMY

UNITED STATES NAVAL OBSERVATORY. See NAVAL OBSERVATORY.

UNITED STATES NAVY. See NAVY, UNITED STATES.

UNITED STATES NOTE. See MONEY (U.S. Money Today).

UNITED STATES OFFICE OF EDUCATION. See EDUCATION, OFFICE OF.

UNITED STATES POST OFFICE. See POST OFFICE.

UNITED STATES PRESIDENT. See PRESIDENT OF THE UNITED STATES.

UNITED STATES SEAL. See GREAT SEAL OF THE UNITED STATES.

UNITED STATES SENATE HALL OF FAME. See SENATE (Prestige of the Senate).

UNITED STATES SHIPPING BOARD. See MERCHANT MARINE (The United States Merchant Marine).

UNITED STATES STEEL CORPORATION is one of the world's largest steel producers. It makes nearly a fourth of the steel manufactured in the United States and about 6 per cent of the Free World's total.

The company also produces iron ore, limestone, and coal, and manufactures oil field drilling and pumping equipment. It produces agricultural and industrial chemicals, and basic materials for the plastics industry. The firm produces cement, and it manufactures aluminum and steel siding and other building products for homes and businesses. Other activities of the company include the development, financing, and leasing of real estate; and mortgage operations. For sales, assets, and number of employees of United States Steel Corporation, see MANUFACTURING (table).

The company was organized in 1901, chiefly by Elbert H. "Judge" Gary, a Chicago lawyer. Gary aimed to produce steel in large quantities more efficiently and economically than had been done in the past. J. P. Morgan, a famous American banker, financed the corporation, which began business with assets of $1,400,000,000. The firm was the first billion-dollar corporation in the nation's history.

The corporation originally included a number of companies that manufactured steel bridges, sheet steel, steel tubing, steel hoops, tin plate, and other metal products. Through the years, U.S. Steel gradually absorbed these companies. The corporation's head-

quarters are located in New York City and Pittsburgh.

Critically reviewed by UNITED STATES STEEL CORPORATION

See also FAIRLESS, BENJAMIN F.; GARY, ELBERT H.; HOOD, CLIFFORD F.

UNITED STATES STEEL FOUNDATION, a nonprofit organization, provides grants to support the activities of charitable, educational, and scientific agencies. It makes financial grants to social welfare organizations and others interested in community and public affairs. The foundation also contributes money for higher education, medicine, health, and hospitals.

The foundation's program of aid to higher education includes research, capital development, and project assistance. The foundation gives study aid through graduate fellowships and financial assistance for the advancement of teaching programs.

The members of the foundation and its governing Board of Trustees are all directors of the United States Steel Corporation (see UNITED STATES STEEL CORPORATION). The corporation established the foundation in 1953 with a grant of $12 million. The corporation usually makes annual financial grants to the foundation. The foundation has headquarters at 600 Grant Street, Pittsburgh, Pa. 15230.

Critically reviewed by the UNITED STATES STEEL FOUNDATION

UNITED STATES SUPREME COURT. See SUPREME COURT OF THE UNITED STATES.

UNITED STATES TARIFF COMMISSION. See TARIFF COMMISSION, UNITED STATES.

UNITED STATES V. RICHARD M. NIXON. See PRESIDENT OF THE UNITED STATES (Challenges to the Presidency).

UNITED STATES WEATHER BUREAU. See WEATHER SERVICE, NATIONAL.

UNITED STEELWORKERS OF AMERICA. See STEELWORKERS OF AMERICA, UNITED.

UNITED WAY OF AMERICA is the national organization for many local groups that raise money to support health, recreation, and welfare agencies. Local United Way groups, including United Funds and Community Chests, operate in more than 2,300 communities. These groups combine the fund-raising activities of many independent organizations into a single, coordinated campaign.

United Way funds help more than 200 major national organizations, including the American Red Cross, Boy Scouts of America, Girl Scouts of the U.S.A., Travelers Aid, and the Urban League. In all, more than 37,000 agencies and programs benefit from United Way. About 20 million volunteer workers, backed by business, labor, and government, conduct United Way campaigns. They raise about $1\frac{1}{2}$ billion a year in contributions from over 39 million individuals and corporations.

The organization was established in 1918 as Community Chests and Councils of America. It became known as United Way of America in 1970. Headquarters are at 801 N. Fairfax Street, Alexandria, Va. 22314.

Critically reviewed by UNITED WAY OF AMERICA

UNITED WORKMEN, ANCIENT ORDER OF. See FRATERNAL SOCIETY (History).

UNITY SCHOOL OF CHRISTIANITY is a religious educational institution that aims to give practical application to the teachings of Jesus Christ in daily living. It emphasizes constructive thinking, affirmative prayer, and spiritual healing. The institution says that the will of God is to give all men health, peace, happiness, and plenty.

Unity is not a denomination. But Unity teachers have formed independent organizations for study in the United States and other countries. These groups, called centers, societies, and churches, are part of the Unity fellowship. Persons who attend Unity are free to belong to other religious organizations.

Charles and Myrtle Fillmore founded the movement in 1889 in Kansas City, Mo. The book *The Household of Faith* tells its story. Unity maintains a prayer and healing department called *Silent Unity*. It also publishes books and magazines. Unity headquarters are at Unity Village, Lee's Summit, Mo. E. PHARABY BOILEAU

UNIVALVE is the name given to a class of mollusks whose shells are in one piece. Limpets and snails are univalves. See also MOLLUSK; LIMPET; SNAIL.

UNIVERSAL COPYRIGHT CONVENTION. See COPYRIGHT (International Copyright).

UNIVERSAL JOINT. See AUTOMOBILE (The Drive Train).

UNIVERSAL LANGUAGE. Language is the main means of communication between peoples. But so many different languages have developed that language has often been a barrier rather than an aid to understanding between peoples. For many years, men have dreamed of setting up an international, universal language which all people could speak and understand.

The arguments in favor of a universal language are simple and obvious. If all peoples spoke the same tongue, cultural and economic ties would be much closer, and good will would increase between countries. But many persons call the promoters of universal languages impractical idealists, and discourage the idea.

René Descartes, a French philosopher, is believed to have originated the idea of a universal language in the 1600's. John Comenius, a Bohemian bishop and educator of the same period, also suggested the idea (see COMENIUS, JOHN A.). More than 200 other languages designed for universal use have been invented since that time.

Volapük was the earliest of these languages to gain much success. The name of the language comes from two of its words meaning *world* and *speak*. Johann Martin Schleyer (1831-1912), a German priest, invented the suggested language in 1879. Later, *Idiom Neutral*, a simplified form of Volapük, was suggested. Other proposed languages include *Spelin*, *Esperanto*, and a revised form of Esperanto called *Ido*. More recently *Interlingua*, *Novial*, and *Interglossa* have received attention.

Some language scholars believe that the world is working by natural processes toward an international tongue. They point out that improved communications are making English almost an international language. To take advantage of this fact, scholars invented *Basic English* (see BASIC ENGLISH). I. A. RICHARDS

See also ESPERANTO; INTERLINGUA; VOLAPÜK; LANGUAGE (Universal Languages).

UNIVERSAL POSTAL UNION. See POSTAL UNION, UNIVERSAL.

UNIVERSAL SET. See SET THEORY (Kinds of Sets).

UNIVERSALIST CHURCH OF AMERICA. See UNITARIAN UNIVERSALIST ASSOCIATION.

UNIVERSE

UNIVERSE consists of all the matter, light, and other forms of radiation and energy that have been discovered by man. The universe also consists of everything that man believes to be present somewhere in space and time as a result of his theories.

The universe includes the earth and everything on it. It also includes everything in the solar system. All the stars, of which the sun is one, are part of the universe. More than 100 billion stars are grouped in the shape of a giant circular galaxy called the Milky Way. The Milky Way is about 100,000 *light-years* across. A light-year is the distance that light travels in a year—about 6 trillion miles (9.7 trillion kilometers).

Studies of distant space with optical and radio telescopes indicate that there are at least as many galaxies in the universe as there are stars in the Milky Way. Galaxies tend to be grouped together into *clusters*, and clusters are grouped into *superclusters*. Most astronomers believe that superclusters are the largest groups that can be told apart in the universe.

Size of the Universe. Scientists do not know if the universe has a certain size. Most astronomers think that bright, unusual galaxies called *quasars* may be the most distant objects in the universe. Quasars may be as far away as 10 billion light-years from the earth. Light from quasars takes so long to reach the earth that it must have been given off several billion years ago to be seen today.

Scientists cannot tell how far away a quasar is from studying its brightness alone. When an object that gives off light moves away from an observer, he sees the light as longer wave lengths. This apparent change in the wave lengths of light is called a *red shift* (see RED SHIFT). Scientists can study the red shift of a quasar to find out how far away the quasar is. The amount of red shift depends on the speed at which the object moves away from the observer. All the distant galaxies and quasars have enormous red shifts. Scientists believe this means that the universe is expanding, with every part of the universe moving away from every other part. This is the fundamental feature of the universe that scientists try to explain with various theories about the universe.

Exploring the Universe. Ancient man thought the universe consisted only of his own locality, distant places of which he had heard, and the sun, moon, planets, and stars. He thought of the heavenly bodies as gods and spirits. During the 1400's and 1500's, voyages of discovery showed that the world was round, not flat as most people had believed. The Polish astronomer and mathematician Nicolaus Copernicus demonstrated that the earth was like the other planets and rotated around the sun.

Later astronomers showed that the sun was a typical star, and that stars visible to the unaided eye were many light-years away. The development of the telescope, the spectroscope, and the photographic plate led to a great expansion of astronomical knowledge. Astronomers then discovered that the sun was in the outer part of the Milky Way. About 1900, they realized that many of the fuzzy patches of light, called *nebulae*, among the stars were other galaxies. Many of these galaxies were at enormous distances from the Milky Way. The discovery of the red shift in distant galaxies led to the theory of the expanding universe. This discovery also formed the basis of *cosmology*, the study of the behavior of the universe.

Cosmological Theories. Most cosmological theories about the universe are based on the idea that any part of the universe is like any other part having the same age. Albert Einstein's general theory of relativity also forms part of the basis for theories about the behavior of the universe. This theory, in turn, is based on two beliefs: (1) that no signal can travel faster than the speed of light, and (2) that the laws of physics are the same everywhere in the universe.

Theories resulting from these ideas involve a universe that expands and contracts. From observing the red shift in distant galaxies, scientists conclude that the universe is expanding. But the overall behavior of the universe depends on the average density of matter in the universe at the present time.

Suppose that all the matter that can be seen in the universe were spread out evenly. There would be only about one atom of hydrogen—the most abundant element in the universe—in 10 cubic yards (7.6 cubic meters) of space. Under these conditions, the universe would be *open*. That is, it would continue to expand indefinitely, and would approach zero density at an infinite time in the future. If man were still living then, he would not see any galaxies beyond those in his local supercluster. All other galaxies would have receded to an infinite distance. The stars would have exhausted all the energy that makes them shine, and would be dark.

On the other hand, large amounts of matter may exist in space in some form that scientists do not know about. If the spread-out density of matter in space were as much as 100 atoms of hydrogen in 10 cubic yards (7.6 cubic meters), the universe would be *closed*. A light beam sent into space in this kind of universe would return to its sender many billions of years later. At some time in the future, perhaps 100 billion years, the expansion would stop. The galaxies in the universe would start coming together again, and matter in the universe would approach infinite density.

Some scientists have suggested theories about the universe that are based on different ideas. For example, the *steady state* theory is based on the belief that any part of the universe is like all other parts at all times. According to this theory, matter is continuously created and formed into new galaxies that replace those which recede to infinite distances. Other scientists believe that Einstein's general theory of relativity is incomplete. They have suggested changes in this theory that predict different things for the expanding universe.

No one knows which, if any, of the theories may prove to be correct. Scientists must wait until the progress of radio and optical astronomy, plus space research, provides certain information. Scientists need to know the average density of the matter in space, the age of the universe, the behavior of red shifts at very large distances, and whether or not Einstein's theory of relativity is correct.

A. G. W. CAMERON

Related Articles in WORLD BOOK include:

Astronomy	Earth	Quasar	Solar System
Cosmology	Galaxy	Relativity	World

See also *Universe* in the RESEARCH GUIDE/INDEX, Volume 22, for a *Reading and Study Guide*.

UNIVERSITIES and COLLEGES

UNIVERSITIES AND COLLEGES are schools that continue a person's education beyond high school. A university or college education helps men and women enjoy richer, more meaningful lives. It prepares many persons for professional careers as doctors, engineers, lawyers, or teachers. It also gives a person a better appreciation of such fields as art, literature, history, human relations, and science. In doing so, a university or college education enables individuals to participate with greater understanding in the affairs of their communities.

Modern universities developed from the European universities of the Middle Ages. These institutions took their name from the Latin word *universitas*. This word referred to a group of people organized for a common purpose. Properly speaking, a school that is called a *university* should deal with nearly all fields of learning. But universities today may differ in the variety of their educational programs, and in their specialized fields of study. Most universities provide a wide range of graduate programs and have a number of undergraduate schools. They may also have graduate professional schools or colleges. But few universities teach as many branches of learning as the word *university* implies.

The first European colleges were merely groups of students who banded together through common interests. In English universities, colleges were formed to provide living quarters and a dining room for various groups of students. Usually these students took similar studies, and so the word *college* came to refer to a specific field of learning.

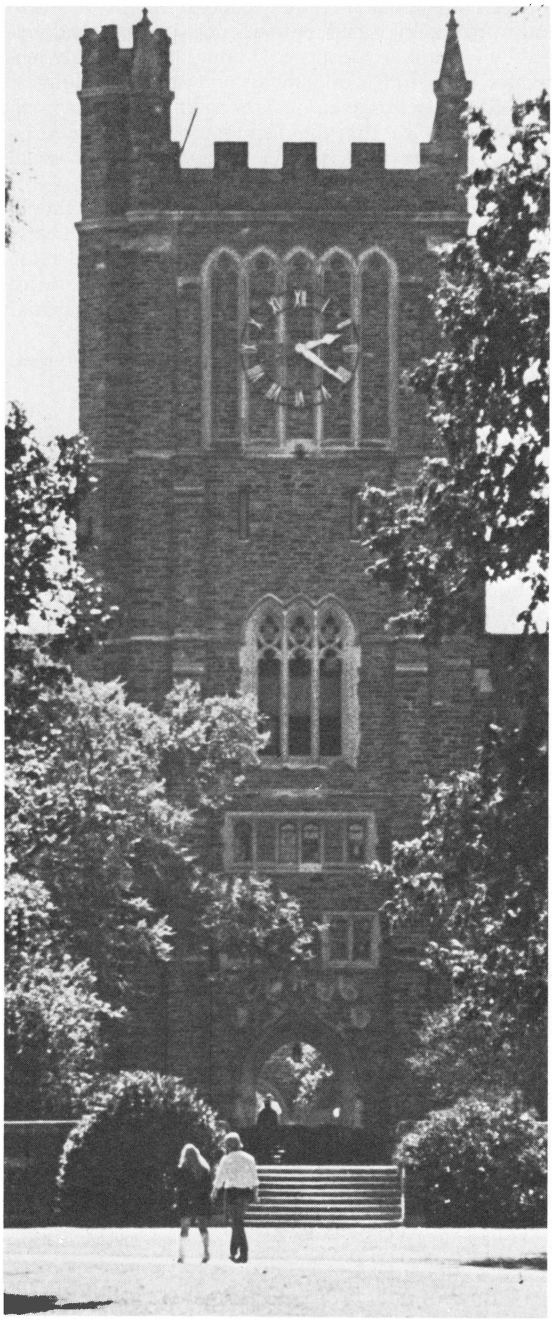
Harvard University, the oldest institution of higher learning in the United States, at first only prepared men for the ministry. Today, we would call such a school a *college of theology*, or a *seminary* (see SEMINARY). Later, schools broadened their courses to teach the liberal arts (see LIBERAL ARTS). These became known as *colleges of liberal arts*. The first universities in the United States divided their courses into various fields of learning, and called the departments that taught each branch *colleges* or *schools*. In this way, the word *college* has come to have two meanings in the United States. It may refer to a part of a university that teaches a special branch of knowledge, or to a separate institution which specializes in a single branch of knowledge.

The type of learning available at individual colleges can often be determined from their names. Liberal-arts colleges usually call themselves simply *colleges*. Other schools may be identified by such names as *teachers colleges*, *agricultural colleges*, or *dental colleges*. Modern universities have many kinds of colleges or schools, from liberal arts to law, medicine, theology, dentistry, and fine arts. *Junior colleges*—also called *community colleges*—mainly offer two-year study programs. Some of these programs prepare a person for a semiprofessional career or occupation. After completing a junior college program, some students transfer to a "senior" college or university for additional study.

Going to College

Most high school students at some time in their studies face two questions: "Should I attend college?" and

John E. Corbally, Jr., the contributor of this article, is President of the University of Illinois.



Duke University News Service

Universities and Colleges prepare many persons for careers and help them enjoy richer, more meaningful lives.

UNIVERSITIES AND COLLEGES

"What college will serve my purposes best?" The student should take stock of his personal abilities and desires. He must decide whether or not he will receive specific preparation in college that will help him in his lifework. For example, he may find that special vocational training, rather than a college education, will better prepare him for his chosen career (see VOCATIONAL EDUCATION).

Decisions about attending college should be made only after serious thought about one's life goals. Individuals who enroll in a college without being strongly motivated may find it difficult to perform successfully as students. A person who decides against attending college must realize that the decision does not necessarily keep him from increasing in earning ability or social status.

Selecting a School. The person who decides he should attend college must choose the school that most nearly fits his needs, his pocketbook, and his personal likes. He can discover many of the facts by talking to his friends and his teachers. He can learn about particular schools by writing to them for information.

There are a number of basic questions a student should ask about any school he is considering.

1. Does the school offer the courses in which I am interested?

2. How well is the school equipped in general buildings, libraries, laboratories, and other property?

3. What teaching methods does the school use? What is the average size of each class?

4. What is the standing of the school? Is it accredited? What is the standing of the particular college or department of the school in which I intend to do most of my work?

5. What are the school's tuition, fees, and living expenses? Are opportunities available for earning all, or part of, my expenses while I attend school?

6. Does the school offer the *extracurricular* (nonacademic) activities in which I am interested?

7. How is the school located with regard to transportation, living quarters, and general conveniences?

Entrance Requirements of the various universities and colleges may differ considerably. In general, they require satisfactory completion of a high school course. Most require that freshmen have taken certain courses in high schools. Many schools will not admit students whose high school grades are below a certain average. As more students seek to attend universities or colleges, entrance requirements tend to become higher.

Many institutions require students to pass an entrance examination. Schools may also give intelligence and aptitude tests for later counseling. For example, a student's adviser may use the test results to help him in his work. See COLLEGE ENTRANCE EXAMINATION.

Colleges and universities state their entrance requirements in their catalogs. They nearly always require a *transcript* (copy) of an applicant's high school credits, as well as letters of recommendation. Entrance examinations are generally given several months before the school term begins. Freshmen usually take the intelligence and aptitude tests during an orientation period, frequently called *Freshmen Week* in the United States.

A person without a high school diploma should not assume that higher education is closed to him. Many colleges and universities admit men and women who have not completed high school. This procedure allows the schools to serve an increasing number of adults seeking continuing education. It also helps extend educational opportunities to such persons as military veterans and members of minority groups. Before enrolling the applicant, the university or college evaluates his work experience and reviews the score he receives on special tests. These tests are designed to measure whether a person's knowledge is equivalent to that of an average high school graduate.

Accrediting. A prospective college student should know the standing of the institution he intends to enter. Colleges and universities in the United States are accredited by six regional accrediting authorities. These authorities base their judgment on the equipment, financial status, requirements, and teaching standards of the schools.

Professional societies accredit the various professional schools. For example, the American Medical Association accredits medical schools. State boards of education also accredit schools in their states. Credits from approved schools may be used to obtain teaching certificates and professional licenses within the state.

The table with this article includes all universities and colleges fully accredited by one of the six regional accrediting associations of the Federation of Regional Accrediting Commissions of Higher Education. This list was compiled from *Education Directory, 1974-75: Higher Education*, published by the United States Department of Health, Education, and Welfare.

For a complete list of degree-granting universities and colleges in Canada, and a discussion of higher education in Canada, see CANADA (Education).

Size. Universities and colleges in the United States range in enrollment from fewer than a hundred students to about 300,000. In order of enrollment of all campuses, the ten largest are: California State University and Colleges; City University of New York; State University of New York; University of Wisconsin; University of California; University of North Carolina; University of Texas; Indiana University; University of Minnesota; and University of Illinois. Canada's largest university, the University of Toronto, has an enrollment of about 30,000.

Many universities have more than one campus. For example, the State University of New York has more than 70 campuses. A prospective student should take into consideration the enrollment of individual campuses as well as the enrollment of the whole university.

College Costs vary widely. Most college catalogs list the average living costs for one year, as well as the tuition and other fees. In 1976, the cost of tuition, fees, room, and board at public universities was about $2,400 for district or state residents and about $3,150 for nonresidents. The cost at private universities was about $4,700.

Working Your Way. Many college students earn all or part of their expenses. Many have part-time jobs while they attend school, such as working in stores and restaurants. Most schools offer students jobs, such as waiting on tables in dormitories or working in the library. Schools often operate employment bureaus to help find part-time jobs for their students. Some stu-

UNIVERSITIES AND COLLEGES

Each of the universities and colleges listed in this table is fully accredited by one of the six regional associations of the Federation of Regional Accrediting Commissions of Higher Education. All of these schools grant bachelor's or advanced degrees. For a list of Canadian universities and colleges, see CANADA (table).

Name	Location	Founded	Control	Student Body	Enrollment
Abilene Christian College	Abilene, Tex.	1906	Private	Coed.	4,049
Academy of the New Church	Bryn Athyn, Pa.	1876	General Church of the New Jerusalem	Coed.	110
Adams State College	Alamosa, Colo.	1921	State	Coed.	2,812
Adelphi University	Garden City, N.Y.	1896	Private	Coed.	8,115
Adrian College	Adrian, Mich.	1845	Methodist	Coed.	1,125
Agnes Scott College	Decatur, Ga.	1889	Private	Women	576
Air Force Institute of Technology	Wright-Patterson Air Force Base, Ohio	1946	Federal	Coed.	640
Akron, University of	Akron, Ohio	1870	State	Coed.	20,235
Alabama, University of	Tuscaloosa, Ala.	1831	State	Coed.	14,938
Alabama Agricultural and Mechanical University	Normal, Ala.	1875	State	Coed.	3,498
Alabama in Birmingham, University of	Birmingham, Ala.	1966	State	Coed.	9,471
Alabama in Huntsville, University of	Huntsville, Ala.	1964	State	Coed.	3,012
Alabama State University	Montgomery, Ala.	1929	State	Coed.	3,879
Alaska, University of	College, Alaska	1917	State	Coed.	2,928
Alaska Methodist University	Anchorage, Alaska	1957	Methodist	Coed.	1,039
Albany State College	Albany, Ga.	1903	State	Coed.	1,733
Albertus Magnus College	New Haven, Conn.	1925	Roman Catholic	Women	473
Albion College	Albion, Mich.	1835	Methodist	Coed.	1,783
Albright College	Reading, Pa.	1856	Methodist	Coed.	1,557
Albuquerque, University of	Albuquerque, N.Mex.	1940	Roman Catholic	Coed.	2,650
Alcorn State University	Lorman, Miss.	1871	State	Coed.	2,538
Alderson-Broaddus College	Philippi, W.Va.	1871	Baptist	Coed.	997
Alfred University	Alfred, N.Y.	1857	Private	Coed.	1,893
Allegheny College	Meadville, Pa.	1815	Private	Coed.	1,934
Allentown College of St. Francis de Sales	Center Valley, Pa.	1965	Roman Catholic	Coed.	606
Alliance College	Cambridge Springs, Pa.	1912	Private	Coed.	524
Alma College	Alma, Mich.	1886	Presbyterian	Coed.	1,214
Alvernia College	Reading, Pa.	1958	Roman Catholic	Coed.	203
Alverno College	Milwaukee	1887	Roman Catholic	Women	1,145
American Baptist Seminary of the West	Covina, Calif.	1871	Baptist	Coed.	122
American Graduate School of International Management	Glendale, Ariz.	1946	Private	Coed.	689
American International College	Springfield, Mass.	1885	Private	Coed.	2,426
American University	Washington, D.C.	1893	Methodist	Coed.	13,301
Amherst College	Amherst, Mass.	1821	Private	Coed.	1,301
Ana G. Méndez Educational Foundation	San Juan, P.R.	1959	Private	Coed.	4,643
Turabo University College	Caguas, P.R.	1972	Private	Coed.	2,070
Anderson College	Anderson, Ind.	1917	Church of God	Coed.	1,661
Andrews University	Berrien Springs, Mich.	1874	Adventist	Coed.	2,119
Angelo State University	San Angelo, Tex.	1965	State	Coed.	4,267
Anna Maria College	Paxton, Mass.	1946	Roman Catholic	Coed.	603
Annhurst College	Woodstock, Conn.	1941	Roman Catholic	Coordinate	305
Antioch College	Yellow Springs, Ohio	1852	Private	Coed.	3,981
Aquinas College	Grand Rapids, Mich.	1923	Roman Catholic	Coed.	1,488
Aquinas Institute of Theology	Dubuque, Iowa	1964	Roman Catholic	Coed.	145
Arizona, University of	Tucson, Ariz.	1885	State	Coed.	29,258
Arizona State University	Tempe, Ariz.	1885	State	Coed.	28,724
Arkansas, University of	Fayetteville, Ark.	1871	State	Coed.	12,473
	Little Rock, Ark.	1927	State	Coed.	5,360
	Monticello, Ark.	1909	State	Coed.	1,689
	Pine Bluff, Ark.	1929	State	Coed.	2,083
Arkansas College	Batesville, Ark.	1872	Presbyterian	Coed.	479
Arkansas Polytechnic College	Russellville, Ark.	1909	State	Coed.	2,169
Arkansas State University	Jonesboro, Ark.	1909	State	Coed.	6,730
Armstrong College	Berkeley, Calif.	1918	Private	Coed.	642
Armstrong State College	Savannah, Ga.	1964	State	Coed.	3,210
Art Center College of Design	Los Angeles	1930	Private	Coed.	1,045
Asbury College	Wilmore, Ky.	1890	Private	Coed.	1,115
Ashland College	Ashland, Ohio	1878	Brethren	Coed.	2,332
Assumption College	Worcester, Mass.	1904	Roman Catholic	Coed.	1,632
Athenaeum of Ohio	Cincinnati, Ohio	1829	Roman Catholic	Men	220
Athens College	Athens, Ala.	1822	Methodist	Coed.	764

Enrollment figures based on *Education Directory, 1974-75: Higher Education*, U.S. Dept. of Health, Education, and Welfare.

Name	Location	Founded	Control	Student Body	Enrollment
Atlanta College of Art	Atlanta, Ga.	1944	Private	Coed.	332
Atlanta University	Atlanta, Ga.	1865	Private	Coed.	1,154
Atlantic Christian College	Wilson, N.C.	1902	Disciples of Christ	Coed.	1,721
Atlantic Union College	South Lancaster, Mass.	1882	Adventist	Coed.	674
Auburn University	Auburn, Ala.	1856	State	Coed.	15,705
	Montgomery, Ala.	1969	State	Coed.	2,042
Augsburg College	Minneapolis, Minn.	1869	Lutheran	Coed.	1,703
Augusta College	Augusta, Ga.	1963	State	Coed.	3,353
Augustana College	Rock Island, Ill.	1860	Lutheran	Coed.	2,334
Augustana College	Sioux Falls, S.Dak.	1860	Lutheran	Coed.	2,082
Aurora College	Aurora, Ill.	1893	Adventist	Coed.	1,112
Austin College	Sherman, Tex.	1849	Presbyterian	Coed.	1,149
Austin Peay State University	Clarksville, Tenn.	1927	State	Coed.	4,124
Averett College	Danville, Va.	1971	Private	Coed.	994
Avila College	Kansas City, Mo.	1867	Roman Catholic	Coed.	1,065
Azusa Pacific College	Azusa, Calif.	1899	Private	Coed.	1,129
Babson College	Wellesley, Mass.	1919	Private	Coed.	2,200
Baker University	Baldwin City, Kans.	1858	Methodist	Coed.	744
Baldwin-Wallace College	Berea, Ohio	1845	Methodist	Coed.	2,862
Ball State University	Muncie, Ind.	1918	State	Coed.	17,108
Baltimore, University of	Baltimore, Md.	1925	Private	Coed.	5,420
Baltimore Hebrew College	Baltimore, Md.	1919	Private	Coed.	121
Bangor Theological Seminary	Bangor, Me.	1905	Private	Coed.	130
Bank Street College of Education	New York City	1916	Private	Coed.	1,254
Baptist College at Charleston	Charleston, S.C.	1964	Baptist	Coed.	2,241
Barat College	Lake Forest, Ill.	1919	Roman Catholic	Women	732
Barber-Scotia College	Concord, N.C.	1867	Presbyterian	Coed.	460
Bard College	Annandale-on-Hudson, N.Y.	1860	Private	Coed.	762
Barrington College	Barrington, R.I.	1900	Private	Coed.	575
Barry College	Miami Shores, Fla.	1940	Roman Catholic	Coed.	1,387
Bates College	Lewiston, Me.	1855	Private	Coed.	1,224
Bayamón Central University	Bayamón, P.R.	1970	Roman Catholic	Coed.	905
Baylor College of Medicine	Houston	1969	Private	Coed.	596
Baylor University	Waco, Tex.	1845	Baptist	Coed.	8,050
Beaver College	Glenside, Pa.	1853	Presbyterian	Coed.	732
Belhaven College	Jackson, Miss.	1894	Presbyterian	Coed.	742
Bellarmine College	Louisville, Ky.	1938	Roman Catholic	Coed.	1,530
Belmont Abbey College	Belmont, N.C.	1876	Roman Catholic	Coed.	622
Belmont College	Nashville, Tenn.	1951	Baptist	Coed.	930
Beloit College	Beloit, Wis.	1846	Private	Coed.	1,777
Bemidji State College	Bemidji, Minn.	1919	State	Coed.	5,537
Benedict College	Columbia, S.C.	1870	Private	Coed.	1,280
Benedictine College	Atchison, Kans.	1858	Roman Catholic	Coed.	1,060
Bennett College	Greensboro, N.C.	1873	Methodist	Women	557
Bennington College	Bennington, Vt.	1932	Private	Coed.	604
Bentley College	Waltham, Mass.	1961	Private	Coed.	3,512
Berea College	Berea, Ky.	1855	Private	Coed.	1,341
Berklee College of Music	Boston	1962	Private	Coed.	1,660
Berry College	Mount Berry, Ga.	1902	Private	Coed.	1,306
Bethany Bible College	Santa Cruz, Calif.	1954	Assemblies of God	Coed.	455
Bethany College	Lindsborg, Kans.	1881	Lutheran	Coed.	685
Bethany College	Bethany, W.Va.	1840	Private	Coed.	1,191
Bethany Nazarene College	Bethany, Okla.	1920	Nazarene	Coed.	1,270
Bethany Theological Seminary	Oak Brook, Ill.	1911	Brethren	Coed.	87
Bethel College	Mishawaka, Ind.	1947	United Missionary Church	Coed.	391
Bethel College	North Newton, Kans.	1887	Mennonite	Coed.	564
Bethel College	St. Paul, Minn.	1871	Baptist	Coed.	1,139
Bethel College	McKenzie, Tenn.	1842	Presbyterian	Coed.	444
Bethune-Cookman College	Daytona Beach, Fla.	1904	Methodist	Coed.	1,215
Biola College	La Mirada, Calif.	1906	Private	Coed.	2,176
Birmingham-Southern College	Birmingham, Ala.	1856	Methodist	Coed.	872
Biscayne College	Miami, Fla.	1962	Roman Catholic	Coed.	1,150
Bishop College	Dallas	1881	Baptist	Coed.	1,596
Black Hills State College	Spearfish, S.Dak.	1883	State	Coed.	1,727
Blackburn College	Carlinville, Ill.	1857	Private	Coed.	572
Bloomfield College	Bloomfield, N.J.	1868	Presbyterian	Coed.	1,408
Bloomsburg State College	Bloomsburg, Pa.	1839	State	Coed.	5,155
Blue Mountain College	Blue Mountain, Miss.	1873	Baptist	Women	308
Bluefield State College	Bluefield, W.Va.	1895	State	Coed.	1,231
Bluffton College	Bluffton, Ohio	1900	Mennonite	Coed.	699
Boise State University	Boise, Idaho	1965	State	Coed.	9,359
Borromeo College of Ohio	Wickliffe, Ohio	1953	Roman Catholic	Men	100
Boston College	Chestnut Hill, Mass.	1863	Roman Catholic	Coed.	12,381

Name	Location	Founded	Control	Student Body	Enrollment
Boston Conservatory of Music	Boston	1867	Private	Coed.	543
Boston State College	Boston	1852	State	Coed.	10,002
Boston University	Boston	1839	Private	Coed.	23,581
Bowdoin College	Brunswick, Me.	1794	Private	Coed.	1,163
Bowie State College	Bowie, Md.	1867	State	Coed.	2,797
Bowling Green State University	Bowling Green, Ohio	1910	State	Coed.	16,049
Bradford College	Haverhill, Mass.	1971	Private	Coed.	310
Bradley University	Peoria, Ill.	1897	Private	Coed.	5,236
Brandeis University	Waltham, Mass.	1948	Private	Coed.	3,310
Brenau College	Gainesville, Ga.	1878	Private	Women	481
Brescia College	Owensboro, Ky.	1925	Roman Catholic	Coed.	931
Briar Cliff College	Sioux City, Iowa	1930	Roman Catholic	Coed.	782
Briarcliff College	Briarcliff Manor, N.Y.	1965	Private	Women	280
Bridgeport, University of	Bridgeport, Conn.	1927	Private	Coed.	8,180
Bridgewater College	Bridgewater, Va.	1880	Brethren	Coed.	803
Bridgewater State College	Bridgewater, Mass.	1840	State	Coed.	7,116
Brigham Young University	Provo, Utah	1875	Church of Jesus Christ of Latter-day Saints	Coed.	26,205
Hawaii Campus	Laie, Oahu, Hawaii	1955	Church of Jesus Christ of Latter-day Saints	Coed.	1,078
Brooks Institute	Santa Barbara, Calif.	1945	Private	Coed.	650
Brown University	Providence, R.I.	1764	Private	Coed.	6,524
Bryan College	Dayton, Tenn.	1930	Private	Coed.	533
Bryant College	Smithfield, R.I.	1916	Private	Coed.	4,309
Bryn Mawr College	Bryn Mawr, Pa.	1885	Private	Women	1,494
Bucknell University	Lewisburg, Pa.	1846	Private	Coed.	3,184
Buena Vista College	Storm Lake, Iowa	1891	Presbyterian	Coed.	757
Butler University	Indianapolis	1855	Private	Coed.	4,443
Cabrini College	Radnor, Pa.	1957	Roman Catholic	Coed.	481
Caldwell College	Caldwell, N.J.	1939	Roman Catholic	Women	872
California, University of	Berkeley, Calif.	1868	State	Coed.	30,061
	Davis, Calif.	1922	State	Coed.	15,839
	Irvine, Calif.	1965	State	Coed.	8,520
	Los Angeles	1919	State	Coed.	31,234
	Riverside, Calif.	1954	State	Coed.	5,430
	San Diego	1935	State	Coed.	7,950
	Santa Barbara, Calif.	1927	State	Coed.	12,606
	Santa Cruz, Calif.	1965	State	Coed.	5,080
California Baptist College	Riverside, Calif.	1950	Baptist	Coed.	657
California College of Arts and Crafts	Oakland, Calif.	1907	Private	Coed.	1,291
California College of Podiatric Medicine	San Francisco	1914	Private	Coed.	295
California Institute of Technology	Pasadena, Calif.	1891	Private	Coed.	1,527
California Institute of the Arts	Valencia, Calif.	1957	Private	Coed.	653
California Lutheran College	Thousand Oaks, Calif.	1959	Lutheran	Coed.	1,783
California State College	California, Pa.	1852	State	Coed.	6,353
California State University and Colleges					
Universities at:	Chico, Calif.	1887	State	Coed.	12,442
	Fresno, Calif.	1921	State	Coed.	15,521
	Fullerton, Calif.	1959	State	Coed.	18,759
	Hayward, Calif.	1959	State	Coed.	15,106
	Long Beach, Calif.	1949	State	Coed.	30,505
	Los Angeles	1947	State	Coed.	24,803
	Northridge, Calif.	1958	State	Coed.	24,961
	Sacramento, Calif.	1947	State	Coed.	18,751
California Polytechnic State University	San Luis Obispo, Calif.	1940	State	Coed.	13,110
California State Polytechnic University	Pomona, Calif.	1956	State	Coed.	11,177
Humboldt State University	Arcata, Calif.	1921	State	Coed.	7,161
San Diego State University	San Diego	1897	State	Coed.	32,926
San Francisco State University	San Francisco	1899	State	Coed.	21,239
San Jose State University	San Jose, Calif.	1857	State	Coed.	27,841
Colleges at:	Bakersfield, Calif.	1970	State	Coed.	2,758
	San Bernardino, Calif.	1965	State	Coed.	3,043
Dominguez Hills Campus	Carson, Calif.	1965	State	Coed.	4,836
Sonoma Campus	Rohnert Park, Calif.	1962	State	Coed.	5,553
Stanislaus Campus	Turlock, Calif.	1960	State	Coed.	2,604
Calvin College	Grand Rapids, Mich.	1876	Reformed	Coed.	3,253
Cameron University	Lawton, Okla.	1970	State	Coed.	4,274

Name	Location	Founded	Control	Student Body	Enrollment
Campbell College	Buies Creek, N.C.	1963	Baptist	Coed.	2,331
Campbellsville College	Campbellsville, Ky.	1906	Baptist	Coed.	693
Canisius College	Buffalo, N.Y.	1870	Roman Catholic	Coed.	4,242
Capital University	Columbus, Ohio	1830	Lutheran	Coed.	2,034
Cardinal Glennon College	St. Louis	1818	Roman Catholic	Men	112
Cardinal Stritch College	Milwaukee	1937	Roman Catholic	Coed.	1,024
Carleton College	Northfield, Minn.	1866	Private	Coed.	1,662
Carlow College	Pittsburgh	1929	Roman Catholic	Women	1,065
Carnegie-Mellon University	Pittsburgh	1900	Private	Coed.	4,379
Carroll College	Helena, Mont.	1909	Roman Catholic	Coed.	1,015
Carroll College	Waukesha, Wis.	1840	Presbyterian	Coed.	1,205
Carson-Newman College	Jefferson City, Tenn.	1851	Baptist	Coed.	1,677
Carthage College	Kenosha, Wis.	1847	Lutheran	Coed.	1,648
Case Western Reserve University	Cleveland	1826	Private	Coed.	8,714
Castleton State College	Castleton, Vt.	1867	State	Coed.	1,631
Catawba College	Salisbury, N.C.	1851	United Church of Christ	Coed.	1,147
Cathedral College of the Immaculate Conception	Douglaston, N.Y.	1948	Roman Catholic	Men	266
Catholic Theological Union at Chicago	Chicago	1969	Roman Catholic	Coed.	151
Catholic University of America	Washington, D.C.	1887	Roman Catholic	Coed.	6,654
Catholic University of Puerto Rico	Ponce, P.R.	1948	Roman Catholic	Coed.	6,930
Cedar Crest College	Allentown, Pa.	1867	Private	Women	785
Centenary College of Louisiana	Shreveport, La.	1825	Methodist	Coed.	787
Central Arkansas, University of	Conway, Ark.	1907	State	Coed.	4,819
Central College	Pella, Iowa	1853	Reformed	Coed.	1,350
Central Connecticut State College	New Britain, Conn.	1849	State	Coed.	12,862
Central Methodist College	Fayette, Mo.	1854	Methodist	Coed.	744
Central Michigan University	Mount Pleasant, Mich.	1892	State	Coed.	16,511
Central Missouri State University	Warrensburg, Mo.	1871	State	Coed.	10,075
Central State University	Wilberforce, Ohio	1887	State	Coed.	2,385
Central State University	Edmond, Okla.	1890	State	Coed.	11,330
Central Washington State College	Ellensburg, Wash.	1890	State	Coed.	6,438
Central Wesleyan College	Central, S.C.	1958	Wesleyan	Coed.	316
Centre College of Kentucky	Danville, Ky.	1819	Private	Coed.	808
Chadron State College	Chadron, Nebr.	1911	State	Coed.	2,104
Chaminade College of Honolulu	Honolulu, Hawaii	1955	Roman Catholic	Coed.	1,696
Chapman College	Orange, Calif.	1861	Private	Coed.	5,535
Charleston, College of	Charleston, S.C.	1770	Private	Coed.	3,562
Chatham College	Pittsburgh	1869	Private	Women	635
Chestnut Hill College	Philadelphia	1871	Roman Catholic	Women	926
Cheyney State College	Cheyney, Pa.	1837	State	Coed.	2,309
Chicago, Schools of the Art Institute of	Chicago	1866	Private	Coed.	1,526
Chicago, University of	Chicago	1890	Private	Coed.	7,496
Chicago State University	Chicago	1867	State	Coed.	5,634
Christian Brothers College	Memphis	1854	Roman Catholic	Coed.	820
Cincinnati, University of	Cincinnati, Ohio	1819	Municipal	Coed.	32,961
Citadel, The	Charleston, S.C.	1842	State	Coed.	2,965
Claflin College	Orangeburg, S.C.	1869	Methodist	Coed.	712
Claremont Graduate School	Claremont, Calif.	1925	Private	Coed.	1,381
Claremont Men's College	Claremont, Calif.	1947	Private	Men	869
Clarion State College	Clarion, Pa.	1866	State	Coed.	4,543
Clark College	Atlanta, Ga.	1869	Methodist	Coed.	1,325
Clark University	Worcester, Mass.	1887	Private	Coed.	2,449
Clarke College	Dubuque, Iowa	1843	Roman Catholic	Women	651
Clarkson College of Technology	Potsdam, N.Y.	1896	Private	Coed.	2,485
Clemson University	Clemson, S.C.	1889	State	Coed.	9,461
Cleveland Institute of Art	Cleveland	1946	Private	Coed.	822
Cleveland State University	Cleveland	1923	State	Coed.	15,201
Coe College	Cedar Rapids, Iowa	1851	Private	Coed.	1,162
Coker College	Hartsville, S.C.	1908	Private	Coed.	513
Colby College	Waterville, Me.	1813	Private	Coed.	1,577
Colby College—New Hampshire	New London, N.H.	1943	Private	Women	623
Colgate University	Hamilton, N.Y.	1819	Private	Coed.	2,519
College Misericordia	Dallas, Pa.	1924	Roman Catholic	Women	1,101
Colorado, University of	Boulder, Colo.	1861	State	Coed.	21,122
	Colorado Springs, Colo.	1965	State	Coed.	2,909
	Denver	1964	State	Coed.	7,475
Colorado College	Colorado Springs, Colo.	1874	Private	Coed.	1,776
Colorado School of Mines	Golden, Colo.	1874	State	Coed.	1,688
Colorado State University	Fort Collins, Colo.	1870	State	Coed.	17,427
Colorado Women's College	Denver	1888	Private	Women	842

Name	Location	Founded	Control	Student Body	Enrollment
Columbia College	Chicago	1944	Private	Coed.	1,041
Columbia College	Columbia, Mo.	1973	Disciples of Christ	Coed.	784
Columbia College	Columbia, S.C.	1854	Methodist	Women	915
Columbia Union College	Takoma Park, Md.	1904	Adventist	Coed.	897
Columbia University:					
Main Division	New York City	1754	Private	Coed.	15,432
Barnard College	New York City	1893	Private	Women	1,972
College of Pharmaceutical Sciences	New York City	1905	Private	Coed.	268
Teachers College	New York City	1901	Private	Coed.	5,397
Columbus College	Columbus, Ga.	1966	State	Coed.	4,094
Conception Seminary College	Conception, Mo.	1883	Roman Catholic	Men	54
Concord College	Athens, W.Va.	1872	State	Coed.	1,855
Concordia College	Moorhead, Minn.	1891	Lutheran	Coed.	2,439
Concordia College	St. Paul, Minn.	1893	Lutheran	Coed.	677
Concordia College	Bronxville, N.Y.	1972	Lutheran	Coed.	494
Concordia Senior College	Fort Wayne, Ind.	1839	Lutheran	Coed.	473
Concordia Teachers College	River Forest, Ill.	1864	Lutheran	Coed.	1,272
Concordia Teachers College	Seward, Nebr.	1894	Lutheran	Coed.	1,539
Connecticut, University of	Storrs, Conn.	1881	State	Coed.	17,819
Connecticut College	New London, Conn.	1911	Private	Coed.	2,002
Conservative Baptist Theological Seminary	Denver	1950	Baptist	Coed.	213
Converse College	Spartanburg, S.C.	1889	Private	Women	1,084
Cooper Union	New York City	1859	Private	Coed.	876
Coppin State College	Baltimore	1900	State	Coed.	2,653
Cornell College	Mount Vernon, Iowa	1853	Private	Coed.	905
Cornell University	Ithaca, N.Y.	1865	Private; State	Coed.	9,505
Covenant College	Lookout Mountain, Tenn.	1955	Presbyterian	Coed.	480
Covenant Theological Seminary	St. Louis, Mo.	1956	Presbyterian	Coed.	124
Cranbrook Academy of Art	Bloomfield Hills, Mich.	1942	Private	Coed.	147
Creighton University	Omaha, Nebr.	1878	Roman Catholic	Coed.	4,355
Culver-Stockton College	Canton, Mo.	1853	Disciples of Christ	Coed.	639
Cumberland College	Williamsburg, Ky.	1961	Baptist	Coed.	1,716
Curry College	Milton, Mass.	1938	Private	Coed.	1,003
Dakota State College	Madison, S.Dak.	1881	State	Coed.	972
Dakota Wesleyan University	Mitchell, S.Dak.	1885	Methodist	Coed.	451
Dallas, University of	Irving, Tex.	1956	Roman Catholic	Coed.	1,561
Dallas Baptist College	Dallas	1969	Baptist	Coed.	1,340
Dallas Theological Seminary	Dallas	1925	Private	Men	595
Dana College	Blair, Nebr.	1884	Lutheran	Coed.	647
Dartmouth College	Hanover, N.H.	1769	Private	Coed.	4,080
David Lipscomb College	Nashville, Tenn.	1947	Private	Coed.	2,129
Davidson College	Davidson, N.C.	1836	Presbyterian	Coed.	1,118
Davis and Elkins College	Elkins, W.Va.	1904	Presbyterian	Coed.	860
Dayton, University of	Dayton, Ohio	1850	Roman Catholic	Coed.	7,688
Defiance College	Defiance, Ohio	1850	Private	Coed.	940
Delaware, University of	Newark, Del.	1833	State	Coed.	17,420
Delaware State College	Dover, Del.	1891	State	Coed.	2,021
Delaware Valley College of Science and Agriculture	Doylestown, Pa.	1896	Private	Coed.	1,333
Delta State University	Cleveland, Miss.	1924	State	Coed.	3,207
Denison University	Granville, Ohio	1831	Private	Coed.	2,155
Denver, University of	Denver	1864	Private	Coed.	8,514
DePaul University	Chicago	1898	Private; Roman Catholic	Coed.	9,567
DePauw University	Greencastle, Ind.	1837	Private	Coed.	2,345
Detroit, University of	Detroit	1877	Private; Roman Catholic	Coed.	8,806
Detroit Institute of Technology	Detroit	1891	Private	Coed.	995
Dickinson College	Carlisle, Pa.	1773	Private	Coed.	1,726
Dickinson State College	Dickinson, N.Dak.	1917	State	Coed.	1,148
Dillard University	New Orleans	1869	Private	Coed.	1,007
District of Columbia Teachers College	Washington, D.C.	1955	Municipal	Coed.	3,175
Divine Word College	Epworth, Iowa	1964	Roman Catholic	Men	73
Doane College	Crete, Nebr.	1858	Private	Coed.	613
Dominican College	Houston	1946	Roman Catholic	Women	307
Dominican College of Blauvelt	Blauvelt, N.Y.	1972	Private	Coed.	815
Dominican College of San Rafael	San Rafael, Calif.	1850	Roman Catholic	Coed.	890
Don Bosco College	Newton, N.J.	1938	Roman Catholic	Men	130
Dordt College	Sioux Center, Iowa	1965	Private	Coed.	955
Dowling College	Oakdale, N.Y.	1959	Private	Coed.	1,647
Drake University	Des Moines, Iowa	1881	Private	Coed.	7,244
Drew University	Madison, N.J.	1867	Methodist	Coed.	1,838

Name	Location	Founded	Control	Student Body	Enrollment
Drexel University	Philadelphia	1891	Private	Coed.	8,393
Dropsie University	Philadelphia	1907	Private	Coed.	101
Drury College	Springfield, Mo.	1873	Private	Coed.	2,322
Dubuque, University of	Dubuque, Iowa	1852	Presbyterian	Coed.	915
Duke University	Durham, N.C.	1838	Private	Coed.	8,698
Duns Scotus College	Southfield, Mich.	1930	Roman Catholic	Men	326
Duquesne University	Pittsburgh	1878	Roman Catholic	Coed.	8,348
D'Youville College	Buffalo, N.Y.	1908	Roman Catholic	Coed.	1,086
Earlham College	Richmond, Ind.	1847	Quaker	Coed.	1,200
East Central Oklahoma State University	Ada, Okla.	1907	State	Coed.	3,006
East Stroudsburg State College	East Stroudsburg, Pa.	1893	State	Coed.	3,746
East Tennessee State University	Johnson City, Tenn.	1909	State	Coed.	9,532
East Texas Baptist College	Marshall, Tex.	1912	Baptist	Coed.	713
East Texas State University	Commerce, Tex.	1889	State	Coed.	9,914
Eastern Baptist Theological Seminary	Philadelphia	1925	Baptist	Coed.	172
Eastern College	St. Davids, Pa.	1932	Baptist	Coed.	580
Eastern Connecticut State College	Willimantic, Conn.	1889	State	Coed.	2,827
Eastern Illinois University	Charleston, Ill.	1895	State	Coed.	8,688
Eastern Kentucky University	Richmond, Ky.	1906	State	Coed.	11,592
Eastern Mennonite College	Harrisonburg, Va.	1917	Mennonite	Coed.	957
Eastern Michigan University	Ypsilanti, Mich.	1849	State	Coed.	20,686
Eastern Montana College	Billings, Mont.	1925	State	Coed.	2,757
Eastern Nazarene College	Quincy, Mass.	1900	Nazarene	Coed.	867
Eastern New Mexico University	Portales, N.Mex.	1934	State	Coed.	4,173
Eastern Oregon College	La Grande, Ore.	1929	State	Coed.	1,488
Eastern Washington State College	Cheney, Wash.	1890	State	Coed.	6,726
Eckerd College	St. Petersburg, Fla.	1960	Private	Coed.	939
Edgecliff College	Cincinnati, Ohio	1935	Roman Catholic	Coed.	895
Edgewood College	Madison, Wis.	1927	Roman Catholic	Coed.	485
Edinboro State College	Edinboro, Pa.	1857	State	Coed.	6,929
Eisenhower College	Seneca Falls, N.Y.	1968	Private	Coed.	779
Elizabethtown College	Elizabethtown, Pa.	1899	Brethren	Coed.	2,020
Elmhurst College	Elmhurst, Ill.	1865	Private	Coed.	2,701
Elmira College	Elmira, N.Y.	1855	Private	Coed.	3,423
Elon College	Elon College, N.C.	1889	United Church of Christ	Coed.	2,005
Embry-Riddle Aeronautical University	Daytona Beach, Fla.	1962	Private	Coed.	1,745
Emerson College	Boston	1880	Private	Coed.	1,672
Emmanuel College	Boston	1919	Roman Catholic	Women	968
Emory and Henry College	Emory, Va.	1836	Methodist	Coed.	858
Emory University	Atlanta, Ga.	1836	Methodist	Coed.	6,746
Emporia Kansas State College	Emporia, Kans.	1863	State	Coed.	6,013
Erskine College	Due West, S.C.	1839	Presbyterian	Coed.	734
Eureka College	Eureka, Ill.	1855	Private	Coed.	441
Evangel College	Springfield, Mo.	1955	Assemblies of God	Coed.	1,143
Evangelical Lutheran Theological Seminary	Columbus, Ohio	1830	Lutheran	Coed.	211
Evansville, University of	Evansville, Ind.	1854	Private	Coed.	5,118
Evergreen State College	Olympia, Wash.	1967	State	Coed.	2,035
Fairfield University	Fairfield, Conn.	1942	Roman Catholic	Coed.	4,500
Fairleigh Dickinson University	Rutherford, N.J.	1941	Private	Coed.	18,273
Fairmont State College	Fairmont, W.Va.	1867	State	Coed.	3,473
Federal City College	Washington, D.C.	1968	Municipal	Coed.	7,382
Ferris State College	Big Rapids, Mich.	1884	State	Coed.	8,584
Finch College	New York City	1900	Private	Women	379
Findlay College	Findlay, Ohio	1882	Church of God	Coed.	975
Fisk University	Nashville, Tenn.	1865	Private	Coed.	1,569
Fitchburg State College	Fitchburg, Mass.	1894	State	Coed.	6,748
Flagler College	St. Augustine, Fla.	1968	Private	Coed.	375
Florida, University of	Gainesville, Fla.	1853	State	Coed.	25,641
Florida Agricultural and Mechanical University	Tallahassee, Fla.	1887	State	Coed.	5,194
Florida Atlantic University	Boca Raton, Fla.	1961	State	Coed.	6,473
Florida Institute of Technology	Melbourne, Fla.	1958	Private	Coed.	2,588
Florida Memorial College	Miami, Fla.	1892	Private	Coed.	757
Florida Southern College	Lakeland, Fla.	1885	Methodist	Coed.	1,425
Florida State University	Tallahassee, Fla.	1857	State	Coed.	20,390
Florida Technological University	Orlando, Fla.	1969	State	Coed.	7,814
Fontbonne College	St. Louis	1917	Roman Catholic	Coed.	623
Fordham University	New York City	1841	Private; Roman Catholic	Coed.	14,297
Fort Hays Kansas State College	Hays, Kans.	1901	State	Coed.	4,603

Name	Location	Founded	Control	Student Body	Enrollment
Fort Lewis College	Durango, Colo.	1911	State	Coed.	2,579
Fort Valley State College	Fort Valley, Ga.	1895	State	Coed.	1,835
Fort Wright College	Spokane, Wash.	1907	Roman Catholic	Women	360
Framingham State College	Framingham, Mass.	1839	State	Coed.	4,522
Francis Marion College	Florence, S.C.	1970	State	Coed.	1,901
Franconia College	Franconia, N.H.	1965	Private	Coed.	484
Franklin and Marshall College	Lancaster, Pa.	1787	Private	Coed.	2,691
Franklin College of Indiana	Franklin, Ind.	1834	Private	Coed.	637
Franklin Pierce College	Rindge, N.H.	1962	Private	Coed.	985
Friends University	Wichita, Kans.	1898	Quaker	Coed.	889
Frostburg State College	Frostburg, Md.	1902	State	Coed.	3,172
Fuller Theological Seminary	Pasadena, Calif.	1947	Private	Coed.	602
Furman University	Greenville, S.C.	1826	Baptist	Coed.	2,205
Gallaudet College	Washington, D.C.	1864	Private	Coed.	907
Gannon College	Erie, Pa.	1944	Roman Catholic	Coed.	3,214
Gardner-Webb College	Boiling Springs, N.C.	1969	Baptist	Coed.	1,525
Garrett-Evangelical Theological Seminary	Evanston, Ill.	1972	Methodist	Coed.	370
General Motors Institute	Flint, Mich.	1919	Private	Coed.	3,052
Geneva College	Beaver Falls, Pa.	1848	Presbyterian	Coed.	1,448
George Fox College	Newberg, Ore.	1892	Quaker	Coed.	487
George Mason University	Fairfax, Va.	1965	State	Coed.	4,926
George Peabody College for Teachers	Nashville, Tenn.	1875	Private	Coed.	1,959
George Washington University	Washington, D.C.	1821	Private	Coed.	21,542
George Williams College	Downers Grove, Ill.	1890	Private	Coed.	1,083
Georgetown College	Georgetown, Ky.	1787	Baptist	Coed.	1,052
Georgetown University	Washington, D.C.	1789	Roman Catholic	Coed.	10,251
Georgia, University of	Athens, Ga.	1785	State	Coed.	22,774
Georgia College	Milledgeville, Ga.	1889	State	Coed.	2,551
Georgia Institute of Technology	Atlanta, Ga.	1885	State	Coed.	8,036
Southern Technical Institute	Marietta, Ga.	1972	State	Coed.	1,817
Georgia Southern College	Statesboro, Ga.	1908	State	Coed.	5,921
Georgia Southwestern College	Americus, Ga.	1964	State	Coed.	2,433
Georgia State University	Atlanta, Ga.	1914	State	Coed.	17,443
Georgian Court College	Lakewood, N.J.	1908	Roman Catholic	Women	735
Gettysburg College	Gettysburg, Pa.	1832	Private	Coed.	1,945
Glassboro State College	Glassboro, N.J.	1923	State	Coed.	11,757
Glenville State College	Glenville, W.Va.	1872	State	Coed.	1,543
Goddard College	Plainfield, Vt.	1938	Private	Coed.	1,891
Golden Gate Baptist Theological Seminary	Mill Valley, Calif.	1944	Baptist	Coed.	268
Golden Gate University	San Francisco	1901	Private	Coed.	7,000
Gonzaga University	Spokane, Wash.	1887	Roman Catholic	Coed.	2,958
Gordon College	Wenham, Mass.	1889	Private	Coed.	955
Goshen College	Goshen, Ind.	1894	Mennonite	Coed.	1,242
Goucher College	Towson, Md.	1885	Private	Women	1,000
Graceland College	Lamoni, Iowa	1895	Reorganized Church of Jesus Christ of Latter Day Saints	Coed.	1,274
Graduate Theological Union	Berkeley, Calif.	1962	Private	Coed.	219
Grambling State University	Grambling, La.	1901	State	Coed.	3,761
Grand Canyon College	Phoenix	1949	Baptist	Coed.	936
Grand Valley State College	Allendale, Mich.	1960	State	Coed.	5,920
Gratz College	Philadelphia	1952	Private	Coed.	422
Great Falls, College of	Great Falls, Mont.	1932	Roman Catholic	Coed.	998
Greensboro College	Greensboro, N.C.	1838	Methodist	Coed.	626
Greenville College	Greenville, Ill.	1892	Methodist	Coed.	913
Grinnell College	Grinnell, Iowa	1846	Private	Coed.	1,314
Grove City College	Grove City, Pa.	1876	Private	Coed.	2,131
Guam, University of	Agana, Guam	1952	Territory	Coed.	3,430
Guilford College	Greensboro, N.C.	1834	Quaker	Coed.	1,584
Gustavus Adolphus College	St. Peter, Minn.	1862	Lutheran	Coed.	2,014
Gwynedd-Mercy College	Gwynedd Valley, Pa.	1948	Roman Catholic	Coed.	851
Hamilton College	Clinton, N.Y.	1793	Private	Men	970
Hamline University	St. Paul, Minn.	1854	Methodist	Coed.	1,330
Hampden-Sydney College	Hampden-Sydney, Va.	1776	Presbyterian	Men	733
Hampshire College	Amherst, Mass.	1965	Private	Coed.	998
Hampton Institute	Hampton, Va.	1868	Private	Coed.	2,795
Hanover College	Hanover, Ind.	1827	Private	Coed.	1,011
Hardin-Simmons University	Abilene, Tex.	1891	Baptist	Coed.	1,553
Harding College	Searcy, Ark.	1924	Church of Christ	Coed.	2,319
Harding Graduate School of Religion	Memphis	1959	Private	Coed.	167

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Harris Teachers College	St. Louis	1875	Municipal	Coed.	912
Hartford, University of	West Hartford, Conn.	1957	Private	Coed.	8,907
Hartford Seminary Foundation	Hartford, Conn.	1836	Private	Coed.	79
Hartwick College	Oneonta, N.Y.	1928	Lutheran	Coed.	1,610
Harvard University	Cambridge, Mass.	1636	Private	Coed.	19,322
Harvey Mudd College	Claremont, Calif.	1955	Private	Coed.	480
Hastings College	Hastings, Nebr.	1882	Presbyterian	Coed.	719
Haverford College	Haverford, Pa.	1833	Private	Men	764
Hawaii, University of	Honolulu, Hawaii	1907	State	Coed.	22,272
Hilo College	Hilo, Hawaii	1970	State	Coed.	1,702
Hawaii Loa College	Kaneohe, Hawaii	1967	Private	Coed.	220
Hawaii Pacific College	Honolulu, Hawaii	1965	Private	Coed.	324
Hebrew College	Brookline, Mass.	1921	Private	Coed.	165
Hebrew Union College—Jewish Institute of Religion	Los Angeles	1954	Jewish Congregations	Coed.	638
	New York City	1922	Jewish Congregations	Coed.	236
	Cincinnati, Ohio	1875	Jewish Congregations	Coed.	207
Heidelberg College	Tiffin, Ohio	1850	Private	Coed.	1,217
Hellenic College	Brookline, Mass.	1968	Greek Orthodox	Coed.	160
Henderson State University	Arkadelphia, Ark.	1890	State	Coed.	3,102
Hendrix College	Conway, Ark.	1884	Methodist	Coed.	1,039
High Point College	High Point, N.C.	1920	Methodist	Coed.	1,086
Hillsdale College	Hillsdale, Mich.	1844	Private	Coed.	1,044
Hiram College	Hiram, Ohio	1850	Private	Coed.	1,304
Hobart and William Smith Colleges	Geneva, N.Y.	1822	Private	Coordinate	1,665
Hofstra University	Hempstead, N.Y.	1935	Private	Coed.	12,381
Hollins College	Roanoke, Va.	1842	Private	Women	1,117
Holy Cross, College of the	Worcester, Mass.	1843	Roman Catholic	Coed.	2,607
Holy Family College	Fremont, Calif.	1946	Roman Catholic	Women	125
Holy Family College	Philadelphia	1954	Roman Catholic	Coed.	908
Holy Names College	Oakland, Calif.	1925	Roman Catholic	Coed.	716
Hood College	Frederick, Md.	1893	Private	Women	789
Hope College	Holland, Mich.	1851	Private	Coed.	2,124
Houghton College	Houghton, N.Y.	1883	Methodist	Coed.	1,314
Houston, University of	Houston	1934	State	Coed.	29,224
Houston Baptist University	Houston	1963	Baptist	Coed.	1,143
Howard Payne College	Brownwood, Tex.	1889	Baptist	Coed.	1,525
Howard University	Washington, D.C.	1867	Private	Coed.	10,061
Huntingdon College	Montgomery, Ala.	1854	Methodist	Coed.	558
Huntington College	Huntington, Ind.	1897	United Brethren in Christ	Coed.	470
Huron College	Huron, S.Dak.	1883	Presbyterian	Coed.	466
Husson College	Bangor, Me.	1953	Private	Coed.	811
Huston-Tillotson College	Austin, Tex.	1877	Methodist; United Church of Christ	Coed.	664
Idaho, College of	Caldwell, Idaho	1891	Presbyterian	Coed.	764
Idaho, University of	Moscow, Idaho	1889	State	Coed.	8,081
Idaho State University	Pocatello, Idaho	1901	State	Coed.	8,546
Iliff School of Theology	Denver	1973	Methodist	Coed.	188
Illinois, University of	Urbana, Ill.	1867	State	Coed.	35,952
Chicago Circle	Chicago	1965	State	Coed.	19,720
Medical Center	Chicago	1881	State	Coed.	4,061
Illinois Benedictine College	Lisle, Ill.	1887	Roman Catholic	Coed.	1,183
Illinois College	Jacksonville, Ill.	1829	Private	Coed.	782
Illinois College of Optometry	Chicago	1947	Private	Coed.	516
Illinois Institute of Technology	Chicago	1892	Private	Coed.	6,375
Illinois State University	Normal, Ill.	1857	State	Coed.	18,819
Illinois Wesleyan University	Bloomington, Ill.	1850	Methodist	Coed.	1,717
Immaculata College	Immaculata, Pa.	1920	Roman Catholic	Women	1,039
Immaculate Heart College	Los Angeles	1916	Roman Catholic	Coed.	539
Incarnate Word College	San Antonio	1881	Roman Catholic	Coed.	1,554
Indiana Central College	Indianapolis	1902	Methodist	Coed.	2,462
Indiana Institute of Technology	Fort Wayne, Ind.	1930	Private	Coed.	436
Indiana State University	Terre Haute, Ind.	1865	State	Coed.	15,406
Indiana University	Bloomington, Ind.	1820	State	Coed.	30,714
	Fort Wayne, Ind.	1969	State	Coed.	4,873
	Indianapolis	1969	State	Coed.	17,666
	Kokomo, Ind.	1969	State	Coed.	2,088
	South Bend, Ind.	1969	State	Coed.	5,189
Indiana University Northwest	Gary, Ind.	1969	State	Coed.	4,781
Indiana University Southeast	New Albany, Ind.	1969	State	Coed.	2,489
Indiana University of Pennsylvania	Indiana, Pa.	1871	State	Coed.	10,133
Insurance, College of	New York City	1962	Private	Coed.	1,417

Name	Location	Founded	Control	Student Body	Enrollment
Inter American University of Puerto Rico	San Germán, P.R.	1912	Private	Coed.	3,428
Iona College	New Rochelle, N.Y.	1940	Roman Catholic	Coed.	4,371
Iowa, University of	Iowa City, Iowa	1847	State	Coed.	20,709
Iowa State University of Science and Technology	Ames, Iowa	1858	State	Coed.	19,629
Iowa Wesleyan College	Mount Pleasant, Iowa	1842	Private	Coed.	644
Ithaca College	Ithaca, N.Y.	1892	Private	Coed.	4,136
Jackson State University	Jackson, Miss.	1877	State	Coed.	5,205
Jacksonville State University	Jacksonville, Ala.	1883	State	Coed.	5,500
Jacksonville University	Jacksonville, Fla.	1934	Private	Coed.	2,584
Jamestown College	Jamestown, N.Dak.	1884	Presbyterian	Coed.	514
Jarvis Christian College	Hawkins, Tex.	1938	Disciples of Christ	Coed.	624
Jersey City State College	Jersey City, N.J.	1921	State	Coed.	10,267
Jesuit School of Theology at Berkeley	Berkeley, Calif.	1934	Roman Catholic	Coed.	141
Jewish Theological Seminary of America	New York City	1887	Private	Coed.	510
John Brown University	Siloam Springs, Ark.	1919	Private	Coed.	588
John Carroll University	Cleveland	1886	Roman Catholic	Coed.	3,671
Johns Hopkins University	Baltimore	1876	Private	Coed.	9,626
Johnson C. Smith University	Charlotte, N.C.	1867	Private	Coed.	1,043
Johnson State College	Johnson, Vt.	1828	State	Coed.	1,187
Judaism, University of	Los Angeles	1947	Private	Coed.	309
Judson College	Marion, Ala.	1838	Baptist	Women	407
Judson College	Elgin, Ill.	1963	Baptist	Coed.	326
Juilliard School	New York City	1926	Private	Coed.	1,233
Juniata College	Huntingdon, Pa.	1876	Private	Coed.	1,209
Kalamazoo College	Kalamazoo, Mich.	1833	Baptist	Coed.	1,384
Kansas, University of	Lawrence, Kans.	1864	State	Coed.	21,359
Kansas City Art Institute	Kansas City, Mo.	1962	Private	Coed.	776
Kansas Newman College	Wichita, Kans.	1954	Private	Coed.	600
Kansas State College of Pittsburg	Pittsburg, Kans.	1903	State	Coed.	5,017
Kansas State University of Agriculture and Applied Science	Manhattan, Kans.	1863	State	Coed.	15,158
Kansas Wesleyan University	Salina, Kans.	1886	Methodist	Coed.	476
Kean College of New Jersey	Union, N.J.	1855	State	Coed.	12,462
Kearney State College	Kearney, Nebr.	1905	State	Coed.	4,921
Kent State University	Kent, Ohio	1910	State	Coed.	18,559
Kentucky, University of	Lexington, Ky.	1865	State	Coed.	20,986
Kentucky State University	Frankfort, Ky.	1926	State	Coed.	2,000
Kentucky Wesleyan College	Owensboro, Ky.	1860	Methodist	Coed.	642
Kenyon College	Gambier, Ohio	1824	Private	Coed.	1,394
Keuka College	Keuka Park, N.Y.	1892	Private	Women	667
King College	Bristol, Tenn.	1867	Presbyterian	Coed.	331
King's College	Briarcliff Manor, N.Y.	1938	Private	Coed.	801
King's College	Wilkes-Barre, Pa.	1946	Private; Roman Catholic	Coed.	2,378
Kirkland College	Clinton, N.Y.	1965	Private	Coordinate	625
Knox College	Galesburg, Ill.	1837	Private	Coed.	1,276
Knoxville College	Knoxville, Tenn.	1875	Presbyterian	Coed.	749
Kutztown State College	Kutztown, Pa.	1926	State	Coed.	5,004
Ladycliff College	Highland Falls, N.Y.	1933	Roman Catholic	Women	482
Lafayette College	Easton, Pa.	1826	Private	Coed.	2,237
LaGrange College	La Grange, Ga.	1831	Methodist	Coed.	662
Lake Erie College	Painesville, Ohio	1856	Private	Coed.	767
Lake Forest College	Lake Forest, Ill.	1857	Private	Coed.	1,047
Lake Superior State College	Sault Ste. Marie, Mich.	1966	State	Coed.	1,900
Lakeland College	Sheboygan, Wis.	1862	United Church of Christ	Coed.	434
Lamar University	Beaumont, Tex.	1923	State	Coed.	10,815
Lambuth College	Jackson, Tenn.	1843	Methodist	Coed.	875
Lander College	Greenwood, S.C.	1872	County; Private	Coed.	925
Lane College	Jackson, Tenn.	1882	Methodist	Coed.	715
Langston University	Langston, Okla.	1897	State	Coed.	1,250
La Roche College	Pittsburgh, Pa.	1963	Roman Catholic	Coed.	511
La Salle College	Philadelphia	1863	Roman Catholic	Coed.	6,895
La Verne College	La Verne, Calif.	1891	Brethren	Coed.	1,841
Lawrence Institute of Technology	Southfield, Mich.	1932	Private	Coed.	4,026
Lawrence University	Appleton, Wis.	1847	Private	Coed.	1,420
Institute of Paper Chemistry	Appleton, Wis.	1929	Private	Coed.	65
Lebanon Valley College	Annville, Pa.	1866	Methodist	Coed.	1,299
Lee College	Cleveland, Tenn.	1968	Church of God	Coed.	1,069
Lehigh University	Bethlehem, Pa.	1865	Private	Coed.	5,900

Name	Location	Founded	Control	Student Body	Enrollment
Le Moyne College	Syracuse, N.Y.	1946	Roman Catholic	Coed.	1,706
LeMoyne-Owen College	Memphis	1870	Baptist; United Church of Christ	Coed.	852
Lenoir Rhyne College	Hickory, N.C.	1891	Lutheran	Coed.	1,366
Lesley College	Cambridge, Mass.	1909	Private	Coed.	1,350
LeTourneau College	Longview, Tex.	1946	Private	Coed.	706
Lewis and Clark College	Portland, Ore.	1867	Private	Coed.	2,908
Lewis-Clark State College	Lewiston, Idaho	1965	State	Coed.	1,201
Lewis University	Lockport, Ill.	1950	Roman Catholic	Coed.	2,055
Limestone College	Gaffney, S.C.	1845	Private	Coed.	588
Lincoln Memorial University	Harrogate, Tenn.	1897	Private	Coed.	611
Lincoln University	Jefferson City, Mo.	1866	State	Coed.	2,573
Lincoln University	Lincoln University, Pa.	1854	Private	Coed.	1,061
Lindenwood Colleges	St. Charles, Mo.	1827	Presbyterian	Coordinate	797
Linfield College	McMinnville, Ore.	1849	Baptist	Coed.	1,091
Livingston University	Livingston, Ala.	1835	State	Coed.	1,154
Livingstone College	Salisbury, N.C.	1879	Methodist	Coed.	750
Lock Haven State College	Lock Haven, Pa.	1870	State	Coed.	2,377
Loma Linda University	Loma Linda, Calif.	1905	Adventist	Coed.	1,875
La Sierra Campus	Riverside, Calif.	1945	Adventist	Coed.	1,871
Lone Mountain College	San Francisco	1921	Roman Catholic	Coed.	793
Long Island University:					
Brooklyn Center	New York City	1926	Private	Coed.	6,433
Brooklyn College of Pharmacy	New York City	1886	Private	Coed.	759
C. W. Post Center	Greenvale, N.Y.	1955	Private	Coed.	10,093
Southampton Center	Southampton, N.Y.	1963	Private	Coed.	1,278
Longwood College	Farmville, Va.	1884	State	Coed.	2,380
Loras College	Dubuque, Iowa	1839	Roman Catholic	Coed.	1,403
Loretto Heights College	Denver	1918	Roman Catholic	Coed.	741
Louisiana College	Pineville, La.	1906	Baptist	Coed.	906
Louisiana State University	Baton Rouge, La.	1860	State	Coed.	23,842
	Shreveport, La.	1972	State	Coed.	2,354
University of New Orleans	New Orleans	1958	State	Coed.	12,269
Louisiana Tech University	Ruston, La.	1894	State	Coed.	7,786
Louisville, University of	Louisville, Ky.	1798	State	Coed.	12,230
Lowell State College	Lowell, Mass.	1894	State	Coed.	2,802
Lowell Technological Institute	Lowell, Mass.	1895	State	Coed.	8,743
Loyola College of Baltimore	Baltimore	1852	Roman Catholic	Coed.	3,620
Loyola Marymount University	Los Angeles	1918	Roman Catholic	Coed.	5,126
Loyola University	New Orleans	1904	Roman Catholic	Coed.	4,499
Loyola University of Chicago	Chicago	1870	Roman Catholic	Coed.	15,199
Lubbock Christian College	Lubbock, Tex.	1972	Private	Coed.	1,093
Luther College	Decorah, Iowa	1861	Lutheran	Coed.	1,949
Lutheran Theological Seminary at Gettysburg	Gettysburg, Pa.	1826	Lutheran	Coed.	259
Lutheran Theological Seminary at Philadelphia	Philadelphia	1915	Lutheran	Coed.	119
Lycoming College	Williamsport, Pa.	1812	Methodist	Coed.	1,527
Lynchburg College	Lynchburg, Va.	1903	Private	Coed.	2,023
Lyndon State College	Lyndonville, Vt.	1944	State	Coed.	749
Macalester College	St. Paul, Minn.	1885	Private	Coed.	1,877
MacMurray College	Jacksonville, Ill.	1846	Private	Coed.	861
Madison College	Harrisonburg, Va.	1908	State	Coed.	6,350
Madonna College	Livonia, Mich.	1947	Roman Catholic	Coed.	1,026
Maine, University of	Farmington, Me.	1864	State	Coed.	1,947
	Fort Kent, Me.	1968	State	Coed.	569
	Machias, Me.	1968	State	Coed.	698
	Orono, Me.	1865	State	Coed.	9,795
	Portland-Gorham, Me.	1971	State	Coed.	7,873
	Presque Isle, Me.	1952	State	Coed.	1,354
Maine Maritime Academy	Castine, Me.	1941	State	Coed.	467
Malone College	Canton, Ohio	1957	Quaker	Coed.	832
Manchester College	North Manchester, Ind.	1889	Brethren	Coed.	1,282
Manhattan College	New York City	1853	Private; Roman Catholic	Coed.	4,285
Manhattan School of Music	New York City	1920	Private	Coed.	998
Manhattanville College	Purchase, N.Y.	1841	Private; Roman Catholic	Coed.	1,758
Mankato State College	Mankato, Minn.	1867	State	Coed.	13,268
Mansfield State College	Mansfield, Pa.	1854	State	Coed.	3,182
Marian College	Indianapolis	1937	Roman Catholic	Coed.	960
Marian College of Fond du Lac	Fond du Lac, Wis.	1936	Roman Catholic	Coed.	500
Marietta College	Marietta, Ohio	1835	Private	Coed.	2,101
Marion College	Marion, Ind.	1920	Methodist	Coed.	738

Name	Location	Founded	Control	Student Body	Enrollment
Marist College	Poughkeepsie, N.Y.	1946	Private; Roman Catholic	Coed.	1,911
Marlboro College	Marlboro, Vt.	1947	Private	Coed.	212
Marquette University	Milwaukee	1864	Roman Catholic	Coed.	9,869
Mars Hill College	Mars Hill, N.C.	1964	Baptist	Coed.	1,516
Marshall University	Huntington, W.Va.	1837	State	Coed.	9,774
Mary Baldwin College	Staunton, Va.	1842	Presbyterian	Women	750
Mary College	Bismarck, N.Dak.	1955	Roman Catholic	Coed.	747
Mary Hardin-Baylor College	Belton, Tex.	1845	Baptist	Coed.	814
Mary Immaculate Seminary and College	Northampton, Pa.	1939	Roman Catholic	Men	54
Mary Washington College	Fredericksburg, Va.	1919	State	Coed.	2,106
Marycrest College	Davenport, Iowa	1954	Roman Catholic	Coed.	1,036
Marygrove College	Detroit	1905	Roman Catholic	Coed.	1,128
Maryknoll Seminary	Maryknoll, N.Y.	1911	Roman Catholic	Coed.	74
Maryland, University of	College Park, Md.	1807	State	Coed.	33,299
Eastern Shore	Princess Anne, Md.	1935	State	Coed.	1,041
Maryland Institute, College of Art	Baltimore	1931	Private	Coed.	1,046
Marylhurst Education Center	Marylhurst, Ore.	1930	Roman Catholic	Coed.	746
Marymount College	Salina, Kans.	1922	Roman Catholic	Coed.	609
Marymount College	Tarrytown, N.Y.	1907	Roman Catholic	Women	1,038
Marymount Manhattan College	New York City	1936	Roman Catholic	Women	1,572
Maryville College	Maryville, Tenn.	1819	Presbyterian	Coed.	722
Maryville College of the Sacred Heart	St. Louis	1846	Roman Catholic	Coed.	1,021
Marywood College	Scranton, Pa.	1915	Roman Catholic	Coed.	2,600
Massachusetts, University of	Amherst, Mass.	1863	State	Coed.	25,040
	Boston	1971	State	Coed.	5,662
Massachusetts College of Art	Boston	1873	State	Coed.	1,324
Massachusetts College of Pharmacy	Boston	1936	Private	Coed.	970
Massachusetts Institute of Technology	Cambridge, Mass.	1861	Private	Coed.	7,834
Massachusetts Maritime Academy	Buzzards Bay, Mass.	1970	State	Men	600
Mayville State College	Mayville, N.Dak.	1889	State	Coed.	600
McKendree College	Lebanon, Ill.	1837	Private	Coed.	561
McMurry College	Abilene, Tex.	1923	Methodist	Coed.	1,380
McNeese State University	Lake Charles, La.	1939	State	Coed.	5,819
McPherson College	McPherson, Kans.	1887	Brethren	Coed.	506
Medaille College	Buffalo, N.Y.	1937	Roman Catholic	Coed.	413
Medical College of Georgia	Augusta, Ga.	1828	State	Coed.	2,140
Medical College of Wisconsin	Milwaukee	1913	Private	Coed.	553
Medical University of South Carolina	Charleston, S.C.	1971	State	Coed.	1,668
Meharry Medical College	Nashville, Tenn.	1876	Private	Coed.	683
Memphis Academy of Arts	Memphis	1940	Private	Coed.	233
Memphis State University	Memphis	1925	State	Coed.	20,194
Menlo College	Menlo Park, Calif.	1927	Private	Coed.	515
Mennonite Brethren Biblical Seminary	Fresno, Calif.	1955	Mennonite	Coed.	76
Mercer University	Atlanta, Ga.	1968	Baptist	Coed.	443
	Macon, Ga.	1833	Baptist	Coed.	2,031
Mercy College	Dobbs Ferry, N.Y.	1961	Private	Coed.	2,003
Mercy College of Detroit	Detroit	1941	Roman Catholic	Coed.	1,898
Mercyhurst College	Erie, Pa.	1926	Roman Catholic	Coed.	1,242
Meredith College	Raleigh, N.C.	1891	Baptist	Women	1,438
Merrimack College	North Andover, Mass.	1947	Roman Catholic	Coed.	2,049
Mesa College	Grand Junction, Colo.	1974	State	Coed.	1,932
Messiah College	Grantham, Pa.	1951	Private	Coed.	842
Methodist College	Fayetteville, N.C.	1964	Methodist	Coed.	658
Metropolitan State College	Denver	1967	State	Coed.	9,469
Miami, University of	Coral Gables, Fla.	1925	Private	Coed.	16,066
Miami University	Oxford, Ohio	1809	State	Coed.	13,211
Michigan, University of	Ann Arbor, Mich.	1817	State	Coed.	37,317
	Dearborn, Mich.	1971	State	Coed.	2,938
	Flint, Mich.	1965	State	Coed.	2,905
Michigan State University	East Lansing, Mich.	1855	State	Coed.	41,649
Michigan Technological University	Houghton, Mich.	1885	State	Coed.	4,975
Middle Tennessee State University	Murfreesboro, Tenn.	1911	State	Coed.	9,677
Middlebury College	Middlebury, Vt.	1800	Private	Coed.	1,936
Midland Lutheran College	Fremont, Nebr.	1887	Lutheran	Coed.	717
Midwestern Baptist Theological Seminary	Kansas City, Mo.	1958	Baptist	Coed.	271
Midwestern University	Wichita Falls, Tex.	1922	State	Coed.	4,004
Miles College	Birmingham, Ala.	1908	Methodist	Coed.	1,208

Name	Location	Founded	Control	Student Body	Enrollment
Millersville State College	Millersville, Pa.	1855	State	Coed.	6,147
Milligan College	Milligan College, Tenn.	1867	Private	Coed.	764
Millikin University	Decatur, Ill.	1901	Presbyterian	Coed.	1,513
Mills College	Oakland, Calif.	1852	Private	Women	1,026
Mills College of Education	New York City	1909	Private	Women	139
Millsaps College	Jackson, Miss.	1892	Methodist	Coed.	1,087
Milton College	Milton, Wis.	1867	Private	Coed.	544
Milwaukee School of Engineering	Milwaukee	1917	Private	Coed.	2,053
Minneapolis College of Art and Design	Minneapolis, Minn.	1886	Private	Coed.	700
Minnesota, University of	Duluth, Minn.	1921	State	Coed.	6,377
	Minneapolis-St. Paul, Minn.	1851	State	Coed.	55,929
	Morris, Minn.	1960	State	Coed.	1,760
Minot State College	Minot, N.Dak.	1913	State	Coed.	2,550
Mississippi, University of	University, Miss.	1844	State	Coed.	8,598
Mississippi College	Clinton, Miss.	1826	Baptist	Coed.	2,436
Mississippi State University	Mississippi State, Miss.	1878	State	Coed.	11,001
Mississippi University for Women	Columbus, Miss.	1884	State	Women	2,752
Mississippi Valley State University	Itta Bena, Miss.	1950	State	Coed.	2,533
Missouri, University of	Columbia, Mo.	1839	State	Coed.	25,022
	Kansas City, Mo.	1933	State	Coed.	10,459
	Rolla, Mo.	1870	State	Coed.	4,912
	St. Louis	1963	State	Coed.	12,155
Missouri Southern State College	Joplin, Mo.	1967	State	Coed.	3,077
Missouri Valley College	Marshall, Mo.	1889	Presbyterian	Coed.	600
Missouri Western State College	St. Joseph, Mo.	1969	State	Coed.	3,161
Mobile College	Mobile, Ala.	1961	Baptist	Coed.	656
Molloy College	Rockville Centre, N.Y.	1955	Roman Catholic	Women	1,092
Monmouth College	Monmouth, Ill.	1853	Presbyterian	Coed.	983
Monmouth College	West Long Branch, N.J.	1933	Private	Coed.	4,476
Montana, University of	Missoula, Mont.	1893	State	Coed.	9,244
Montana College of Mineral Science and Technology	Butte, Mont.	1893	State	Coed.	749
Montana State University	Bozeman, Mont.	1893	State	Coed.	8,025
Montclair State College	Montclair, N.J.	1908	State	Coed.	14,307
Monterey Institute of Foreign Studies	Monterey, Calif.	1955	Private	Coed.	350
Montevallo, University of	Montevallo, Ala.	1893	State	Coed.	3,132
Moore College of Art	Philadelphia	1844	Private	Women	633
Moorhead State College	Moorhead, Minn.	1887	State	Coed.	4,408
Moravian College	Bethlehem, Pa.	1858	Moravian	Coed.	1,273
Morehead State University	Morehead, Ky.	1922	State	Coed.	6,966
Morehouse College	Atlanta, Ga.	1867	Private	Men	1,209
Morgan State College	Baltimore	1867	State	Coed.	5,986
Morningside College	Sioux City, Iowa	1889	Methodist	Coed.	1,486
Morris Brown College	Atlanta, Ga.	1885	Methodist	Coed.	1,383
Morris Harvey College	Charleston, W.Va.	1888	Private	Coed.	2,768
Mount Angel Seminary	St. Benedict, Ore.	1889	Roman Catholic	Men	110
Mount Holyoke College	South Hadley, Mass.	1836	Private	Women	2,005
Mount Marty College	Yankton, S.Dak.	1936	Roman Catholic	Coed.	571
Mount Mary College	Milwaukee	1850	Roman Catholic	Women	907
Mount Mercy College	Cedar Rapids, Iowa	1928	Roman Catholic	Coed.	809
Mount Saint Alphonsus Seminary	Esopus, N.Y.	1958	Roman Catholic	Men	94
Mount Saint Joseph on the Ohio, College of	Mount St. Joseph, Ohio	1852	Roman Catholic	Women	862
Mount Saint Mary College	Hooksett, N.H.	1934	Roman Catholic	Women	226
Mount Saint Mary College	Newburgh, N.Y.	1954	Private; Roman Catholic	Coed.	775
Mount Saint Mary's College	Los Angeles	1925	Roman Catholic	Coed.	1,280
Mount Saint Mary's College	Emmitsburg, Md.	1808	Roman Catholic	Coed.	1,215
Mount Saint Vincent, College of	New York City	1847	Roman Catholic	Coed.	1,156
Mount Union College	Alliance, Ohio	1846	Methodist	Coed.	1,272
Mount Vernon College	Washington, D.C.	1968	Private	Women	260
Mount Vernon Nazarene College	Mount Vernon, Ohio	1974	Nazarene	Coed.	493
Muhlenberg College	Allentown, Pa.	1848	Lutheran	Coed.	1,923
Mundelein College	Chicago	1930	Private; Roman Catholic	Women	1,224
Murray State University	Murray, Ky.	1922	State	Coed.	7,337
Museum Art School	Portland, Ore.	1968	Private	Coed.	168
Muskingum College	New Concord, Ohio	1837	Presbyterian	Coed.	1,192
Nasson College	Springvale, Me.	1912	Private	Coed.	796
Nathaniel Hawthorne College	Antrim, N.H.	1962	Private	Coed.	650
National College of Education	Evanston, Ill.	1886	Private	Coed.	4,088
Naval Postgraduate School	Monterey, Calif.	1909	Federal	Coed.	1,462

Name	Location	Founded	Control	Student Body	Enrollment
Nazareth College	Kalamazoo, Mich.	1897	Private	Coed.	593
Nazareth College of Rochester	Rochester, N.Y.	1924	Roman Catholic	Coed.	2,114
Nebraska, University of	Lincoln, Nebr.	1869	State	Coed.	21,160
	Omaha, Nebr.	1968	State	Coed.	13,691
Nebraska Wesleyan University	Lincoln, Nebr.	1887	Private	Coed.	1,038
Nevada, University of	Las Vegas, Nev.	1964	State	Coed.	6,479
	Reno, Nev.	1886	State	Coed.	7,120
New England College	Henniker, N.H.	1946	Private	Coed.	1,598
New England Conservatory of Music	Boston	1867	Private	Coed.	587
New Hampshire, University of	Durham, N.H.	1866	State	Coed.	11,252
Keene State College	Keene, N.H.	1909	State	Coed.	2,470
Plymouth State College	Plymouth, N.H.	1870	State	Coed.	2,711
New Hampshire College	Manchester, N.H.	1966	Private	Coed.	1,246
New Haven, University of	West Haven, Conn.	1958	Private	Coed.	5,481
New Jersey Institute of Technology	Newark, N.J.	1881	State; Municipal	Coed.	4,699
New Mexico, University of	Albuquerque, N.Mex.	1889	State	Coed.	19,946
New Mexico Highlands University	Las Vegas, N.Mex.	1893	State	Coed.	2,423
New Mexico Institute of Mining and Technology	Socorro, N.Mex.	1889	State	Coed.	894
New Mexico State University	Las Cruces, N.Mex.	1888	State	Coed.	9,199
New Orleans Baptist Theological Seminary	New Orleans	1917	Baptist	Coed.	624
New Rochelle, College of	New Rochelle, N.Y.	1904	Roman Catholic	Women	2,027
New School for Social Research	New York City	1919	Private	Coed.	3,345
New York, City University of:					
Bernard M. Baruch College	New York City	1968	Municipal	Coed.	14,423
Brooklyn College	New York City	1930	Municipal	Coed.	32,348
City College	New York City	1847	Municipal	Coed.	20,654
Graduate School and University Center	New York City	1961	Municipal	Coed.	2,723
Herbert H. Lehman College	New York City	1955	Municipal	Coed.	14,626
Hunter College	New York City	1870	Municipal	Coed.	23,251
John Jay College of Criminal Justice	New York City	1966	Municipal	Coed.	7,659
Queens College	New York City	1937	Municipal	Coed.	28,688
Richmond College	New York City	1965	Municipal	Coed.	3,478
York College	New York City	1966	Municipal	Coed.	3,267
New York, State University of, College at:	Brockport, N.Y.	1867	State	Coed.	10,250
	Buffalo, N.Y.	1871	State	Coed.	11,654
	Cortland, N.Y.	1869	State	Coed.	6,074
	Fredonia, N.Y.	1868	State	Coed.	5,232
	Geneseo, N.Y.	1871	State	Coed.	6,373
	New Paltz, N.Y.	1886	State	Coed.	8,361
	Oneonta, N.Y.	1863	State	Coed.	6,081
	Oswego, N.Y.	1863	State	Coed.	8,857
	Plattsburgh, N.Y.	1890	State	Coed.	5,708
	Potsdam, N.Y.	1871	State	Coed.	4,701
College of Environmental Science and Forestry	Syracuse, N.Y.	1911	State	Coed.	2,095
Downstate Medical Center	New York City	1950	State	Coed.	1,386
Maritime College at Fort Schuyler	New York City	1847	State	Coed.	782
State University of New York at:	Albany, N.Y.	1844	State	Coed.	14,731
	Binghamton, N.Y.	1946	State	Coed.	8,756
	Buffalo, N.Y.	1846	State	Coed.	21,471
	Stony Brook, N.Y.	1957	State	Coed.	12,134
Upstate Medical Center	Syracuse, N.Y.	1950	State	Coed.	954
New York Institute of Technology	Old Westbury, N.Y.	1958	Private	Coed.	3,133
New York University	New York City	1831	Private	Coed.	28,643
Newberry College	Newberry, S.C.	1856	Lutheran	Coed.	820
Newton College	Newton, Mass.	1946	Roman Catholic	Women	1,002
Niagara University	Niagara University, N.Y.	1856	Roman Catholic	Coed.	3,585
Nicholls State University	Thibodaux, La.	1956	State	Coed.	5,954
Nichols College	Dudley, Mass.	1958	Private	Coed.	677
Norfolk State College	Norfolk, Va.	1956	State	Coed.	5,894
North Adams State College	North Adams, Mass.	1894	State	Coed.	2,598
North Alabama, University of	Florence, Ala.	1830	State	Coed.	3,642

Name	Location	Founded	Control	Student Body	Enrollment
North Carolina, University of	Asheville, N.C.	1963	State	Coed.	1,125
	Chapel Hill, N.C.	1789	State	Coed.	19,320
	Charlotte, N.C.	1963	State	Coed.	6,123
	Greensboro, N.C.	1891	State	Coed.	7,856
	Wilmington, N.C.	1963	State	Coed.	2,542
Appalachian State University	Boone, N.C.	1903	State	Coed.	8,443
East Carolina University	Greenville, N.C.	1907	State	Coed.	10,949
Elizabeth City State University	Elizabeth City, N.C.	1891	State	Coed.	1,146
Fayetteville State University	Fayetteville, N.C.	1877	State	Coed.	4,252
North Carolina Agricultural and Technical State University	Greensboro, N.C.	1891	State	Coed.	4,751
North Carolina Central University	Durham, N.C.	1910	State	Coed.	4,062
North Carolina School of the Arts	Winston-Salem, N.C.	1965	State	Coed.	378
North Carolina State University	Raleigh, N.C.	1887	State	Coed.	14,257
Pembroke State University	Pembroke, N.C.	1887	State	Coed.	1,918
Western Carolina University	Cullowhee, N.C.	1889	State	Coed.	6,016
Winston-Salem State University	Winston-Salem, N.C.	1892	State	Coed.	1,653
North Carolina Wesleyan College	Rocky Mount, N.C.	1964	Methodist	Coed.	510
North Central College	Naperville, Ill.	1861	Methodist	Coed.	853
North Dakota, University of	Grand Forks, N.Dak.	1883	State	Coed.	8,763
North Dakota State University	Fargo, N.Dak.	1889	State	Coed.	7,466
North Georgia College	Dahlonega, Ga.	1873	State	Coed.	1,397
North Park College	Chicago	1891	Evangelical Covenant Church of America	Coed.	1,342
North Texas State University	Denton, Tex.	1890	State	Coed.	15,434
Northeast Louisiana University	Monroe, La.	1914	State	Coed.	9,034
Northeast Missouri State University	Kirksville, Mo.	1867	State	Coed.	6,323
Northeastern Bible College	Essex Fells, N.J.	1964	Private	Coed.	330
Northeastern Illinois University	Chicago	1961	State	Coed.	8,857
Northeastern Oklahoma State University	Tahlequah, Okla.	1846	State	Coed.	5,262
Northeastern University	Boston	1898	Private	Coed.	36,155
Northern Arizona University	Flagstaff, Ariz.	1899	State	Coed.	8,915
Northern Baptist Theological Seminary	Oak Brook, Ill.	1913	Baptist	Coed.	70
Northern Colorado, University of	Greeley, Colo.	1889	State	Coed.	10,886
Northern Illinois University	De Kalb, Ill.	1895	State	Coed.	22,791
Northern Iowa, University of	Cedar Falls, Iowa	1876	State	Coed.	9,479
Northern Kentucky State College	Highland Heights, Ky.	1968	State	Coed.	4,758
Northern Michigan University	Marquette, Mich.	1899	State	Coed.	8,053
Northern Montana College	Havre, Mont.	1929	State	Coed.	1,069
Northern State College	Aberdeen, S.Dak.	1901	State	Coed.	2,277
Northland College	Ashland, Wis.	1892	Private	Coed.	666
Northrop Institute of Technology	Inglewood, Calif.	1942	Private	Coed.	1,391
Northwest Christian College	Eugene, Ore.	1895	Disciples of Christ	Coed.	475
Northwest College of the Assemblies of God	Kirkland, Wash.	1949	Assemblies of God	Coed.	525
Northwest Missouri State University	Maryville, Mo.	1917	State	Coed.	4,969
Northwest Nazarene College	Nampa, Idaho	1913	Nazarene	Coed.	1,058
Northwestern College	Orange City, Iowa	1882	Reformed	Coed.	700
Northwestern Oklahoma State University	Alva, Okla.	1897	State	Coed.	2,208
Northwestern State University of Louisiana	Natchitoches, La.	1884	State	Coed.	6,261
Northwestern University	Evanston, Ill.	1851	Private	Coed.	14,852
Northwood Institute	Midland, Mich.	1971	Private	Coed.	1,285
Norwich University	Northfield, Vt.	1819	Private	Coordinate	1,456
Notre Dame, College of	Belmont, Calif.	1851	Roman Catholic	Coed.	1,344
Notre Dame, University of	Notre Dame, Ind.	1842	Private; Roman Catholic	Coed.	8,393
Notre Dame College	St. Louis	1954	Roman Catholic	Coed.	340
Notre Dame College	Manchester, N.H.	1950	Roman Catholic	Women	412
Notre Dame College	Cleveland	1922	Roman Catholic	Women	507
Notre Dame of Maryland, College of	Baltimore	1895	Roman Catholic	Coordinate	724
Notre Dame Seminary—Graduate School of Theology	New Orleans, La.	1923	Roman Catholic	Coed.	166
Nova University	Fort Lauderdale, Fla.	1971	Private	Coed.	838
Nyack College	Nyack, N.Y.	1882	Christian and Missionary Alliance	Coed.	602
Oakland University	Rochester, Mich.	1959	State	Coed.	9,352
Oakwood College	Huntsville, Ala.	1896	Adventist	Coed.	988

Name	Location	Founded	Control	Student Body	Enrollment
Oberlin College	Oberlin, Ohio	1833	Private	Coed.	2,797
Oblate College	Washington, D.C.	1958	Roman Catholic	Men	71
Occidental College	Los Angeles	1887	Private	Coed.	1,813
Oglethorpe University	Atlanta, Ga.	1835	Private	Coed.	1,032
Ohio Dominican College	Columbus, Ohio	1911	Roman Catholic	Coed.	1,000
Ohio Northern University	Ada, Ohio	1871	Methodist	Coed.	2,583
Ohio State University	Columbus, Ohio	1870	State	Coed.	47,268
	Lima, Ohio	1972	State	Coed.	1,017
	Mansfield, Ohio	1972	State	Coed.	1,090
	Marion, Ohio	1972	State	Coed.	606
	Newark, Ohio	1972	State	Coed.	845
Ohio University	Athens, Ohio	1804	State	Coed.	15,845
Ohio Wesleyan University	Delaware, Ohio	1842	Methodist	Coed.	2,526
Oklahoma, University of	Norman, Okla.	1890	State	Coed.	19,647
Oklahoma Baptist University	Shawnee, Okla.	1910	Baptist	Coed.	1,701
Oklahoma Christian College	Oklahoma City, Okla.	1962	Private	Coed.	1,139
Oklahoma City University	Oklahoma City, Okla.	1904	Methodist	Coed.	5,909
Oklahoma Panhandle State University	Goodwell, Okla.	1909	State	Coed.	1,127
Oklahoma State University	Stillwater, Okla.	1890	State	Coed.	19,167
Old Dominion University	Norfolk, Va.	1930	State	Coed.	12,239
Olivet College	Olivet, Mich.	1844	Private	Coed.	787
Olivet Nazarene College	Kankakee, Ill.	1907	Nazarene	Coed.	1,771
Oral Roberts University	Tulsa, Okla.	1965	Private	Coed.	1,906
Oregon, University of	Eugene, Ore.	1872	State	Coed.	16,043
Oregon College of Education	Monmouth, Ore.	1856	State	Coed.	3,274
Oregon Graduate Center	Beaverton, Ore.	1966	Private	Coed.	15
Oregon Institute of Technology	Klamath Falls, Ore.	1966	State	Coed.	1,790
Oregon State University	Corvallis, Ore.	1868	State	Coed.	15,488
Otis Art Institute of Los Angeles County	Los Angeles	1918	County	Coed.	482
Ottawa University	Ottawa, Kans.	1865	Baptist	Coed.	652
Otterbein College	Westerville, Ohio	1847	Methodist	Coed.	1,244
Ouachita Baptist University	Arkadelphia, Ark.	1886	Baptist	Coed.	1,642
Our Lady of Angels College	Aston, Pa.	1965	Roman Catholic	Women	410
Our Lady of Holy Cross College	New Orleans, La.	1938	Roman Catholic	Coed.	446
Our Lady of the Elms, College of	Chicopee, Mass.	1928	Roman Catholic	Women	421
Our Lady of the Lake College	San Antonio	1896	Roman Catholic	Coed.	2,123
Ozarks, College of the	Clarksville, Ark.	1834	Presbyterian	Coed.	497
Ozarks, School of the	Point Lookout, Mo.	1964	Private	Coed.	1,103
Pace University	New York City	1906	Private	Coed.	7,866
Pacific, University of the	Stockton, Calif.	1851	Private	Coed.	5,727
Pacific Christian College	Fullerton, Calif.	1928	Disciples of Christ; Churches of Christ	Coed.	354
Pacific College	Fresno, Calif.	1965	Mennonite	Coed.	425
Pacific Lutheran University	Tacoma, Wash.	1894	Lutheran	Coed.	3,267
Pacific Oaks College	Pasadena, Calif.	1945	Private	Coed.	363
Pacific School of Religion	Berkeley, Calif.	1866	Private	Coed.	156
Pacific Union College	Angwin, Calif.	1882	Adventist	Coed.	2,108
Pacific University	Forest Grove, Ore.	1849	Private	Coed.	1,077
Paine College	Augusta, Ga.	1882	Methodist	Coed.	696
Palm Beach Atlantic College	West Palm Beach, Fla.	1968	Baptist	Coed.	410
Pan American University	Edinburg, Tex.	1948	State	Coed.	7,031
Park College	Parkville, Mo.	1875	Presbyterian	Coed.	457
Parks College of Aeronautical Technology of St. Louis University	Cahokia, Ill.	1946	Roman Catholic	Coed.	760
Paul Quinn College	Waco, Tex.	1940	African Methodist Episcopal	Coed.	491
Peabody Conservatory of Music	Baltimore	1857	Private	Coed.	454
Pennsylvania, University of	Philadelphia	1756	Private	Coed.	19,435
Pennsylvania College of Optometry	Philadelphia	1919	Private	Coed.	539
Pennsylvania State University	State College, Pa.	1855	Private; State	Coed.	39,537
Pepperdine University	Los Angeles	1937	Private	Coed.	4,200
	Malibu, Calif.	1972	Private	Coed.	1,800
Peru State College	Peru, Nebr.	1867	State	Coed.	770
Pfeiffer College	Misenheimer, N.C.	1885	Methodist	Coed.	1,100
Philadelphia College of Art	Philadelphia	1876	Private	Coed.	1,626
Philadelphia College of Bible	Philadelphia	1958	Private	Coed.	628
Philadelphia College of Pharmacy and Science	Philadelphia	1821	Private	Coed.	1,056
Philadelphia College of Textiles and Science	Philadelphia	1884	Private	Coed.	2,030
Philadelphia Musical Academy	Philadelphia	1915	Private	Coed.	314
Philander Smith College	Little Rock, Ark.	1868	Methodist	Coed.	661

Name	Location	Founded	Control	Student Body	Enrollment
Phillips University	Enid, Okla.	1906	Disciples of Christ	Coed.	1,426
Piedmont College	Demorest, Ga.	1897	United Church of Christ	Coed.	232
Pikeville College	Pikeville, Ky.	1889	Presbyterian	Coed.	780
Pittsburgh, University of	Pittsburgh	1787	Private; State	Coed.	28,315
Pittsburgh Theological Seminary	Pittsburgh	1959	Presbyterian	Coed.	375
Pitzer College	Claremont, Calif.	1964	Private	Coed.	727
Point Loma College	San Diego	1908	Nazarene	Coed.	1,207
Point Park College	Pittsburgh	1966	Private	Coed.	1,784
Polytechnic Institute of New York	New York City	1854	Private	Coed.	4,477
Pomona College	Claremont, Calif.	1887	Private	Coed.	1,310
Portland, University of	Portland, Ore.	1901	Private	Coed.	2,024
Portland State University	Portland, Ore.	1946	State	Coed.	13,163
Pratt Institute	New York City	1887	Private	Coed.	4,411
Presbyterian College	Clinton, S.C.	1880	Presbyterian	Coed.	875
Presbyterian School of Christian Education	Richmond, Va.	1914	Presbyterian	Coed.	116
Princeton Theological Seminary	Princeton, N.J.	1812	Presbyterian	Coed.	644
Princeton University	Princeton, N.J.	1746	Private	Coed.	5,735
Principia College	Elsah, Ill.	1898	Private	Coed.	833
Providence College	Providence, R.I.	1917	Roman Catholic	Coed.	4,157
Puerto Rico, University of	San Juan, P.R.	1903	Territory	Coed.	26,357
Puget Sound, University of	Tacoma, Wash.	1888	Methodist	Coed.	4,551
Purdue University	Indianapolis	1969	State	Coed.	17,666
	Lafayette, Ind.	1869	State	Coed.	26,582
Calumet Campus	Hammond, Ind.	1966	State	Coed.	5,544
Fort Wayne Campus	Fort Wayne, Ind.	1967	State	Coed.	2,964
Queens College	Charlotte, N.C.	1857	Presbyterian	Women	561
Quincy College	Quincy, Ill.	1860	Roman Catholic	Coed.	2,007
Quinnipiac College	Hamden, Conn.	1929	Private	Coed.	2,956
Radcliffe College	Cambridge, Mass.	1879	Private	Women	1,719
Radford College	Radford, Va.	1910	State	Coed.	3,860
Randolph-Macon College	Ashland, Va.	1830	Private	Coed.	829
Randolph-Macon Woman's College	Lynchburg, Va.	1891	Private	Women	716
Redlands, University of	Redlands, Calif.	1907	Baptist	Coed.	2,089
Johnston College	Redlands, Calif.	1969	Baptist	Coed.	330
Reed College	Portland, Ore.	1910	Private	Coed.	1,198
Regis College	Denver	1887	Roman Catholic	Coed.	1,210
Regis College	Weston, Mass.	1927	Roman Catholic	Women	810
Rensselaer Polytechnic Institute	Troy, N.Y.	1824	Private	Coed.	4,679
Rensselaer Polytechnic Institute of Connecticut	Hartford, Conn.	1955	Private	Coed.	563
Rhode Island, University of	Kingston, R.I.	1892	State	Coed.	15,447
Rhode Island College	Providence, R.I.	1854	State	Coed.	8,204
Rhode Island School of Design	Providence, R.I.	1877	Private	Coed.	1,302
Rice University	Houston	1891	Private	Coed.	3,312
Richmond, University of	Richmond, Va.	1830	Baptist	Coordinate	4,199
Ricker College	Houlton, Me.	1949	Private	Coed.	414
Rider College	Trenton, N.J.	1865	Private	Coed.	5,764
Rio Grande College	Rio Grande, Ohio	1883	Private	Coed.	667
Ripon College	Ripon, Wis.	1851	Private	Coed.	1,012
Rivier College	Nashua, N.H.	1933	Roman Catholic	Women	1,095
Roanoke College	Salem, Va.	1842	Lutheran	Coed.	1,299
Robert Morris College	Coraopolis, Pa.	1969	Private	Coed.	3,769
Roberts Wesleyan College	North Chili, N.Y.	1866	Methodist	Coed.	632
Rochester, University of	Rochester, N.Y.	1850	Private	Coed.	8,418
Rochester Institute of Technology	Rochester, N.Y.	1829	Private	Coed.	6,362
Rockford College	Rockford, Ill.	1847	Private	Coed.	1,109
Rockhurst College	Kansas City, Mo.	1910	Roman Catholic	Coed.	2,599
Rocky Mountain College	Billings, Mont.	1883	Private	Coed.	460
Roger Williams College	Bristol, R.I.	1967	Private	Coed.	1,560
Rollins College	Winter Park, Fla.	1885	Private	Coed.	3,865
Roosevelt University	Chicago	1945	Private	Coed.	6,953
Rosary College	River Forest, Ill.	1848	Roman Catholic	Coed.	1,245
Rosary Hill College	Buffalo, N.Y.	1947	Roman Catholic	Coed.	1,310
Rose-Hulman Institute of Technology	Terre Haute, Ind.	1874	Private	Men	1,022
Rosemont College	Rosemont, Pa.	1921	Roman Catholic	Women	607
Rush University of Rush-Presbyterian-St. Luke's Medical Center	Chicago	1973	Private	Coed.	317
Russell College	Burlingame, Calif.	1952	Roman Catholic	Women	20

Name	Location	Founded	Control	Student Body	Enrollment
Russell Sage College	Troy, N.Y.	1916	Private	Women	3,606
Rust College	Holly Springs, Miss.	1866	Methodist	Coed.	697
Rutgers, The State University	New Brunswick, N.J.	1766	State	Coed.	26,608
Sacred Heart, College of the	San Juan, P.R.	1935	Roman Catholic	Women	2,311
Sacred Heart College	Belmont, N.C.	1969	Roman Catholic	Coed.	193
Sacred Heart Seminary College	Detroit	1919	Roman Catholic	Men	131
Sacred Heart University	Bridgeport, Conn.	1967	Roman Catholic	Coed.	2,235
Saginaw Valley College	University Center, Mich.	1964	State	Coed.	2,278
St. Albert's College	Oakland, Calif.	1932	Roman Catholic	Men	50
St. Alphonsus College	Suffield, Conn.	1963	Roman Catholic	Men	79
St. Ambrose College	Davenport, Iowa	1882	Roman Catholic	Coed.	1,270
St. Andrews Presbyterian College	Laurinburg, N.C.	1858	Presbyterian	Coed.	869
St. Anselm's College	Manchester, N.H.	1889	Roman Catholic	Coed.	1,738
St. Augustine's College	Raleigh, N.C.	1867	Episcopal	Coed.	1,442
St. Benedict, College of	St. Joseph, Minn.	1913	Roman Catholic	Coordinate	1,104
St. Bernard College	St. Bernard, Ala.	1892	Roman Catholic	Coed.	491
St. Bonaventure University	St. Bonaventure, N.Y.	1856	Roman Catholic	Coed.	2,359
St. Catherine, College of	St. Paul, Minn.	1905	Roman Catholic	Women	1,537
St. Charles Borromeo Seminary	Philadelphia	1832	Roman Catholic	Men	542
St. Cloud State College	St. Cloud, Minn.	1869	State	Coed.	10,697
St. Edward's University	Austin, Tex.	1881	Roman Catholic	Coed.	1,282
St. Elizabeth, College of	Convent Station, N.J.	1899	Roman Catholic	Women	581
St. Fidelis College	Herman, Pa.	1951	Roman Catholic	Men	62
St. Francis, College of	Joliet, Ill.	1930	Roman Catholic	Coed.	905
St. Francis College	Fort Wayne, Ind.	1890	Roman Catholic	Coed.	1,740
St. Francis College	Biddeford, Me.	1953	Roman Catholic	Coed.	506
St. Francis College	New York City	1858	Roman Catholic	Coed.	2,736
St. Francis College	Loretto, Pa.	1847	Roman Catholic	Coed.	1,542
St. Francis School of Pastoral Ministry	Milwaukee	1856	Roman Catholic	Coed.	163
St. Francis De Sales College	Milwaukee	1970	Roman Catholic	Men	106
St. Hyacinth College and Seminary	Granby, Mass.	1957	Roman Catholic	Men	55
St. John College of Cleveland	Cleveland	1928	Roman Catholic	Coed.	732
St. John Fisher College	Rochester, N.Y.	1951	Roman Catholic	Coed.	1,417
St. John's College	Camarillo, Calif.	1926	Roman Catholic	Men	244
St. John's College	Annapolis, Md.	1696	Private	Coed.	372
	Santa Fe, N.Mex.	1964	Private	Coed.	260
St. John's Seminary	Boston	1941	Roman Catholic	Men	282
St. John's University	Collegeville, Minn.	1857	Roman Catholic	Coordinate	1,748
St. John's University	New York City	1870	Private; Roman Catholic	Coed.	13,626
St. Joseph College	West Hartford, Conn.	1925	Roman Catholic	Women	941
St. Joseph Seminary College	St. Benedict, La.	1969	Roman Catholic	Coed.	89
St. Joseph the Provider, College of	Rutland, Vt.	1954	Private; Roman Catholic	Coed.	501
St. Joseph's College	Rensselaer, Ind.	1889	Roman Catholic	Coed.	1,062
Calumet College	East Chicago, Ind.	1960	Roman Catholic	Coed.	1,688
St. Joseph's College	North Windham, Me.	1915	Roman Catholic	Coed.	507
St. Joseph's College	New York City	1916	Roman Catholic	Coed.	608
St. Joseph's College	Philadelphia	1851	Roman Catholic	Coed.	6,403
St. Joseph's Seminary and College	Yonkers, N.Y.	1833	Roman Catholic	Men	64
St. Lawrence University	Canton, N.Y.	1856	Private	Coed.	2,511
St. Leo College	St. Leo, Fla.	1963	Roman Catholic	Coed.	1,040
St. Louis College of Pharmacy	St. Louis	1932	Private	Coed.	669
St. Louis University	St. Louis	1818	Private; Roman Catholic	Coed.	9,395
St. Martin's College	Olympia, Wash.	1895	Roman Catholic	Coed.	925
St. Mary, College of	Omaha, Nebr.	1923	Roman Catholic	Women	588
St. Mary College	Leavenworth, Kans.	1860	Roman Catholic	Women	481
St. Mary of the Plains College	Dodge City, Kans.	1952	Roman Catholic	Coed.	413
St. Mary-of-the-Woods College	Saint Mary-of-the-Woods, Ind.	1840	Roman Catholic	Women	356
St. Mary's College	Notre Dame, Ind.	1844	Roman Catholic	Women	1,505
St. Mary's College	Winona, Minn.	1912	Roman Catholic	Coed.	1,152
St. Mary's College of California	St. Mary's College, Calif.	1863	Roman Catholic	Coed.	1,077
St. Mary's College of Maryland	St. Marys City, Md.	1967	State	Coed.	1,045
St. Mary's Dominican College	New Orleans	1910	Roman Catholic	Women	864
St. Mary's Seminary and University	Baltimore	1791	Roman Catholic	Men	619
St. Mary's Seminary College	Perryville, Mo.	1834	Roman Catholic	Men	79
St. Mary's University	San Antonio	1852	Roman Catholic	Coed.	3,692
St. Meinrad College	St. Meinrad, Ind.	1854	Roman Catholic	Men	227
St. Michael's College	Winooski, Vt.	1904	Roman Catholic	Coed.	1,561
St. Norbert College	De Pere, Wis.	1898	Roman Catholic	Coed.	1,475
St. Olaf College	Northfield, Minn.	1874	Lutheran	Coed.	2,759

Name	Location	Founded	Control	Student Body	Enrollment
St. Patrick's College	Mountain View, Calif.	1898	Roman Catholic	Men	67
St. Patrick's Seminary	Menlo Park, Calif.	1898	Roman Catholic	Men	81
St. Paul Seminary	St. Paul, Minn.	1896	Roman Catholic	Men	109
St. Paul's College	Lawrenceville, Va.	1888	Episcopal	Coed.	481
St. Peter's College	Jersey City, N.J.	1872	Roman Catholic	Coed.	4,402
St. Rose, College of	Albany, N.Y.	1920	Roman Catholic	Coed.	1,597
St. Scholastica, College of	Duluth, Minn.	1912	Roman Catholic	Coed.	1,014
St. Teresa, College of	Winona, Minn.	1907	Roman Catholic	Women	1,071
St. Thomas, College of	St. Paul, Minn.	1885	Roman Catholic	Men	2,451
St. Thomas, University of	Houston	1947	Roman Catholic	Coed.	1,686
St. Thomas Aquinas College	Sparkill, N.Y.	1972	Private	Coed.	749
St. Thomas Seminary	Denver	1906	Roman Catholic	Men	170
St. Vincent College	Latrobe, Pa.	1846	Roman Catholic	Men	1,011
St. Xavier College	Chicago	1846	Roman Catholic	Coed.	1,145
Salem College	Winston-Salem, N.C.	1772	Moravian	Women	620
Salem College	Salem, W.Va.	1888	Private	Coed.	1,290
Salem State College	Salem, Mass.	1854	State	Coed.	7,319
Salisbury State College	Salisbury, Md.	1925	State	Coed.	2,674
Salve Regina College	Newport, R.I.	1947	Roman Catholic	Coed.	1,065
Sam Houston State University	Huntsville, Tex.	1879	State	Coed.	10,493
Samford University	Birmingham, Ala.	1842	Baptist	Coed.	3,220
San Diego, University of	San Diego	1952	Private	Coed.	2,518
San Francisco, University of	San Francisco	1859	Roman Catholic	Coed.	5,962
San Francisco Art Institute	San Francisco	1871	Private	Coed.	947
San Francisco Conservatory of Music	San Francisco	1917	Private	Coed.	134
San Francisco Theological Seminary	San Anselmo, Calif.	1915	Presbyterian	Coed.	724
Santa Clara, University of	Santa Clara, Calif.	1851	Roman Catholic	Coed.	6,185
Santa Fe, College of	Santa Fe, N.Mex.	1947	Roman Catholic	Coed.	1,231
Sarah Lawrence College	Bronxville, N.Y.	1928	Private	Coed.	868
Savannah State College	Savannah, Ga.	1890	State	Coed.	2,942
Scarritt College for Christian Workers	Nashville, Tenn.	1892	Methodist	Coed.	143
School for International Training	Brattleboro, Vt.	1964	Private	Coed.	349
Science and Arts of Oklahoma, University of	Chickasha, Okla.	1908	State	Coed.	884
Scranton, University of	Scranton, Pa.	1888	Roman Catholic	Coed.	3,762
Scripps College	Claremont, Calif.	1926	Private	Women	578
Seattle Pacific College	Seattle	1891	Methodist	Coed.	1,997
Seattle University	Seattle	1891	Roman Catholic	Coed.	3,159
Seminary of Our Lady of Providence	Warwick, R.I.	1959	Roman Catholic	Men	66
Seminary of St. Pius X	Erlanger, Ky.	1955	Roman Catholic	Men	59
Seminary of St. Vincent de Paul	Boynton Beach, Fla.	1960	Roman Catholic	Men	62
Seton Hall University	South Orange, N.J.	1856	Roman Catholic	Coed.	9,719
Seton Hill College	Greensburg, Pa.	1883	Roman Catholic	Women	783
Shaw University	Raleigh, N.C.	1865	Private	Coed.	1,227
Shenandoah College and Conservatory of Music	Winchester, Va.	1937	Methodist	Coed.	593
Shepherd College	Shepherdstown, W.Va.	1871	State	Coed.	2,004
Shimer College	Mount Carroll, Ill.	1853	Private	Coed.	265
Shippensburg State College	Shippensburg, Pa.	1871	State	Coed.	5,656
Shorter College	Rome, Ga.	1873	Baptist	Coed.	611
Siena College	Loudonville, N.Y.	1937	Roman Catholic	Coed.	2,090
Siena Heights College	Adrian, Mich.	1919	Roman Catholic	Coed.	837
Silver Lake College of the Holy Family	Manitowoc, Wis.	1935	Roman Catholic	Coed.	463
Simmons College	Boston	1899	Private	Women	2,804
Simpson College	San Francisco	1921	Christian and Missionary Alliance	Coed.	301
Simpson College	Indianola, Iowa	1860	Private	Coed.	919
Sioux Falls College	Sioux Falls, S.Dak.	1883	Baptist	Coed.	719
Skidmore College	Saratoga Springs, N.Y.	1911	Private	Coed.	1,831
Slippery Rock State College	Slippery Rock, Pa.	1889	State	Coed.	5,897
Smith College	Northampton, Mass.	1871	Private	Women	2,538
South, University of the	Sewanee, Tenn.	1860	Episcopal	Coed.	1,049
South Alabama, University of	Mobile, Ala.	1963	State	Coed.	5,761
South Carolina, University of	Columbia, S.C.	1801	State	Coed.	20,278
South Carolina State College	Orangeburg, S.C.	1896	State	Coed.	2,909
South Dakota, University of	Springfield, S.Dak.	1881	State	Coed.	1,182
	Vermillion, S.Dak.	1897	State	Coed.	6,586

Name	Location	Founded	Control	Student Body	Enrollment
South Dakota School of Mines and Technology	Rapid City, S.Dak.	1885	State	Coed.	1,469
South Dakota State University	Brookings, S.Dak.	1881	State	Coed.	6,869
South Florida, University of	Tampa, Fla.	1960	State	Coed.	18,988
Southeast Missouri State University	Cape Girardeau, Mo.	1873	State	Coed.	7,669
Southeastern Louisiana University	Hammond, La.	1925	State	Coed.	6,035
Southeastern Massachusetts University	North Dartmouth, Mass.	1949	State	Coed.	5,375
Southeastern Oklahoma State University	Durant, Okla.	1909	State	Coed.	3,402
Southern Baptist Theological Seminary	Louisville, Ky.	1859	Baptist	Coed.	1,467
Southern California, University of	Los Angeles	1880	Private	Coed.	19,870
Southern California College	Costa Mesa, Calif.	1920	Assemblies of God	Coed.	642
Southern California College of Optometry	Fullerton, Calif.	1904	Private	Coed.	294
Southern California School of Theology	Claremont, Calif.	1956	Disciples of Christ; Methodist	Coed.	258
Southern College of Optometry	Memphis	1932	Private	Coed.	579
Southern Colorado State College	Pueblo, Colo.	1963	State	Coed.	5,626
Southern Connecticut State College	New Haven, Conn.	1893	State	Coed.	12,497
Southern Illinois University	Carbondale, Ill.	1907	State	Coed.	19,147
	Edwardsville, Ill.	1957	State	Coed.	11,921
Southern Methodist University	Dallas	1911	Private	Coed.	10,402
Southern Missionary College	Collegedale, Tenn.	1892	Adventist	Coed.	1,555
Southern Mississippi, University of	Hattiesburg, Miss.	1910	State	Coed.	10,914
Southern Oregon College	Ashland, Ore.	1926	State	Coed.	4,499
Southern State College	Magnolia, Ark.	1909	State	Coed.	1,812
Southern University	Baton Rouge, La.	1880	State	Coed.	8,735
	New Orleans	1959	State	Coed.	2,556
Southern Utah State College	Cedar City, Utah	1965	State	Coed.	1,620
Southwest Baptist College	Bolivar, Mo.	1966	Baptist	Coed.	1,123
Southwest Minnesota State College	Marshall, Minn.	1971	State	Coed.	2,137
Southwest Missouri State University	Springfield, Mo.	1908	State	Coed.	10,118
Southwest Texas State University	San Marcos, Tex.	1899	State	Coed.	12,267
Southwestern at Memphis	Memphis	1848	Presbyterian	Coed.	1,110
Southwestern Baptist Theological Seminary	Fort Worth, Tex.	1908	Baptist	Coed.	2,019
Southwestern College	Winfield, Kans.	1885	Methodist	Coed.	591
Southwestern Louisiana, University of	Lafayette, La.	1898	State	Coed.	11,685
Southwestern Oklahoma State University	Weatherford, Okla.	1901	State	Coed.	5,063
Southwestern Union College	Keene, Tex.	1968	Adventist	Coed.	620
Southwestern University	Georgetown, Tex.	1840	Methodist	Coed.	873
Spalding College	Louisville, Ky.	1920	Roman Catholic	Coed.	1,048
Spelman College	Atlanta, Ga.	1881	Private	Women	1,135
Spertus College of Judaica	Chicago	1927	Private	Coed.	363
Spring Arbor College	Spring Arbor, Mich.	1873	Methodist	Coed.	688
Spring Garden College	Philadelphia	1969	Private	Coed.	774
Spring Hill College	Mobile, Ala.	1830	Roman Catholic	Coed.	866
Springfield College	Springfield, Mass.	1885	Private	Coed.	2,045
Stanford University	Stanford, Calif.	1885	Private	Coed.	12,296
Stephen F. Austin State University	Nacogdoches, Tex.	1923	State	Coed.	9,964
Stephens College	Columbia, Mo.	1833	Private	Women	1,886
Sterling College	Sterling, Kans.	1887	Presbyterian	Coed.	469
Stetson University	De Land, Fla.	1883	Baptist	Coed.	2,924
Steubenville, College of	Steubenville, Ohio	1946	Roman Catholic	Coed.	998
Stevens Institute of Technology	Hoboken, N.J.	1870	Private	Coed.	2,071
Stillman College	Tuscaloosa, Ala.	1876	Presbyterian	Coed.	631
Stonehill College	North Easton, Mass.	1948	Roman Catholic	Coed.	2,191
Suffolk University	Boston	1906	Private	Coed.	6,171
Sul Ross State University	Alpine, Tex.	1917	State	Coed.	2,367
Sulpician Seminary of the Northwest	Kenmore, Wash.	1931	Roman Catholic	Men	98
Susquehanna University	Selinsgrove, Pa.	1858	Lutheran	Coed.	1,557
Swarthmore College	Swarthmore, Pa.	1864	Private	Coed.	1,208
Sweet Briar College	Sweet Briar, Va.	1901	Private	Women	722
Syracuse University	Syracuse, N.Y.	1870	Private	Coed.	15,265
Utica College	Utica, N.Y.	1945	Private	Coed.	2,678
Tabor College	Hillsboro, Kans.	1908	Mennonite	Coed.	472
Talladega College	Talladega, Ala.	1890	Private	Coed.	496
Tampa, University of	Tampa, Fla.	1931	Private	Coed.	2,133
Tarkio College	Tarkio, Mo.	1883	Presbyterian	Coed.	572

Name	Location	Founded	Control	Student Body	Enrollment
Taylor University	Upland, Ind.	1846	Private	Coed.	1,445
Temple University	Philadelphia	1884	Private; State	Coed.	28,675
Tennessee, University of	Chattanooga, Tenn.	1886	State	Coed.	4,985
	Knoxville, Tenn.	1794	State	Coed.	26,767
	Martin, Tenn.	1951	State	Coed.	4,884
	Nashville, Tenn.	1971	State	Coed.	4,737
Medical Units	Memphis	1851	State	Coed.	1,960
Tennessee State University	Nashville, Tenn.	1912	State	Coed.	5,256
Tennessee Technological University	Cookeville, Tenn.	1915	State	Coed.	7,062
Tennessee Wesleyan College	Athens, Tenn.	1857	Methodist	Coed.	528
Texas, University of	Arlington, Tex.	1959	State	Coed.	14,028
	Austin, Tex.	1881	State	Coed.	48,098
	El Paso, Tex.	1914	State	Coed.	10,980
	Richardson, Tex.	1969	State	Coed.	382
	San Antonio	1973	State	Coed.	1,113
Health Science Center at:	Dallas	1943	State	Coed.	666
	Houston	1943	State	Coed.	1,274
	San Antonio	1959	State	Coed.	552
Medical Branch	Galveston, Tex.	1881	State	Coed.	921
Texas A&I University	Kingsville, Tex.	1917	State	Coed.	8,043
	Laredo, Tex.	1970	State	Coed.	648
Texas A&M University System:					
Prairie View A&M College	Prairie View, Tex.	1876	State	Coed.	4,610
Tarleton State College	Stephenville, Tex.	1961	State	Coed.	2,921
Texas A&M University	College Station, Tex.	1876	State	Coed.	18,520
Texas Christian University	Fort Worth, Tex.	1873	Private	Coed.	6,405
Texas College	Tyler, Tex.	1905	Methodist	Coed.	558
Texas Lutheran College	Seguin, Tex.	1891	Lutheran	Coed.	1,094
Texas Southern University	Houston	1947	State	Coed.	6,902
Texas Tech University	Lubbock, Tex.	1923	State	Coed.	21,510
Texas Wesleyan College	Fort Worth, Tex.	1891	Methodist	Coed.	1,781
Texas Woman's University	Denton, Tex.	1901	State	Women	6,259
Thiel College	Greenville, Pa.	1870	Lutheran	Coed.	1,047
Thomas College	Waterville, Me.	1963	Private	Coed.	498
Thomas More College	Fort Mitchell, Ky.	1921	Roman Catholic	Coed.	1,455
Tift College	Forsyth, Ga.	1849	Baptist	Women	690
Toledo, University of	Toledo, Ohio	1872	State	Coed.	14,661
Tougaloo College	Tougaloo, Miss.	1869	Private	Coed.	851
Towson State College	Baltimore	1865	State	Coed.	12,420
Transylvania University	Lexington, Ky.	1780	Private	Coed.	697
Trenton State College	Trenton, N.J.	1855	State	Coed.	11,367
Trevecca Nazarene College	Nashville, Tenn.	1942	Nazarene	Coed.	770
Trinity College	Hartford, Conn.	1823	Private	Coed.	2,103
Trinity College	Deerfield, Ill.	1952	Evangelical Free Church of America	Coed.	827
Trinity College	Burlington, Vt.	1925	Roman Catholic	Women	502
Trinity College	Washington, D.C.	1897	Roman Catholic	Women	809
Trinity University	San Antonio	1869	Presbyterian	Coed.	3,361
Tri-State College	Angola, Ind.	1884	Private	Coed.	1,431
Troy State University	Troy, Ala.	1887	State	Coed.	4,539
Tufts University	Medford, Mass.	1852	Private	Coed.	5,619
Tulane University of Louisiana	New Orleans	1834	Private	Coed.	8,871
Tulsa, University of	Tulsa, Okla.	1894	Private	Coed.	6,031
Tusculum College	Greeneville, Tenn.	1794	Presbyterian	Coed.	425
Tuskegee Institute	Tuskegee Institute, Ala.	1881	Private	Coed.	3,171
Union College	Barbourville, Ky.	1879	Methodist	Coed.	861
Union College	Lincoln, Nebr.	1891	Adventist	Coed.	754
Union College	Schenectady, N.Y.	1795	Private	Coed.	3,040
Union Theological Seminary	New York City	1836	Private	Coed.	309
Union Theological Seminary	Richmond, Va.	1971	Presbyterian	Coed.	288
Union University	Jackson, Tenn.	1825	Baptist	Coed.	906
U.S. Air Force Academy	Colorado Springs, Colo.	1954	Federal	Men	4,201
U.S. Coast Guard Academy	New London, Conn.	1876	Federal	Men	1,083
U.S. International University	San Diego	1924	Private	Coed.	5,102
U.S. Merchant Marine Academy	Kings Point, N.Y.	1938	Federal	Coed.	994
U.S. Military Academy	West Point, N.Y.	1802	Federal	Men	4,036
U.S. Naval Academy	Annapolis, Md.	1845	Federal	Men	4,217
Upper Iowa University	Fayette, Iowa	1857	Private	Coed.	797
Upsala College	East Orange, N.J.	1893	Lutheran	Coed.	1,611
Ursinus College	Collegeville, Pa.	1869	Private	Coed.	1,756
Ursuline College	Cleveland	1871	Roman Catholic	Women	407

Name	Location	Founded	Control	Student Body	Enrollment
Utah, University of	Salt Lake City, Utah	1850	State	Coed.	21,034
Utah State University	Logan, Utah	1888	State	Coed.	8,533
Valdosta State College	Valdosta, Ga.	1906	State	Coed.	4,405
Valley City State College	Valley City, N.Dak.	1889	State	Coed.	987
Valparaiso University	Valparaiso, Ind.	1859	Lutheran	Coed.	4,476
Vanderbilt University	Nashville, Tenn.	1872	Private	Coed.	6,825
VanderCook College of Music	Chicago	1972	Private	Coed.	136
Vassar College	Poughkeepsie, N.Y.	1861	Private	Coed.	2,331
Vermont, University of	Burlington, Vt.	1791	State	Coed.	10,551
Villa Maria College	Erie, Pa.	1882	Roman Catholic	Women	693
Villanova University	Villanova, Pa.	1842	Roman Catholic	Coed.	10,305
Virgin Islands, College of the	St. Thomas, U.S. Virgin Is.	1968	State	Coed.	1,698
Virginia, University of	Charlottesville, Va.	1819	State	Coed.	13,732
Clinch Valley College	Wise, Va.	1968	State	Coed.	765
Virginia Commonwealth University	Richmond, Va.	1838	State	Coed.	17,035
Virginia Intermont College	Bristol, Va.	1972	Baptist	Women	556
Virginia Military Institute	Lexington, Va.	1839	State	Men	1,133
Virginia Polytechnic Institute and State University	Blacksburg, Va.	1872	State	Coed.	16,401
Virginia State College	Petersburg, Va.	1882	State	Coed.	4,179
Virginia Union University	Richmond, Va.	1899	Baptist	Coed.	1,405
Virginia Wesleyan College	Norfolk, Va.	1970	Methodist	Coed.	675
Viterbo College	La Crosse, Wis.	1931	Roman Catholic	Coed.	588
Voorhees College	Denmark, S.C.	1897	Episcopal	Coed.	737
Wabash College	Crawfordsville, Ind.	1832	Private	Men	794
Wadhams Hall	Ogdensburg, N.Y.	1972	Roman Catholic	Men	84
Wagner College	New York City	1883	Lutheran	Coed.	2,874
Wake Forest University	Winston-Salem, N.C.	1834	Baptist	Coed.	4,116
Walla Walla College	College Place, Wash.	1892	Adventist	Coed.	1,839
Walsh College	Canton, Ohio	1960	Roman Catholic	Coed.	903
Warner Pacific College	Portland, Ore.	1937	Church of God	Coed.	354
Warren Wilson College	Swannanoa, N.C.	1969	Presbyterian	Coed.	388
Wartburg College	Waverly, Iowa	1852	Lutheran	Coed.	1,290
Washburn University of Topeka	Topeka, Kans.	1865	Municipal	Coed.	5,126
Washington, University of	Seattle	1861	State	Coed.	34,524
Washington and Jefferson College	Washington, Pa.	1781	Private	Coed.	1,130
Washington and Lee University	Lexington, Va.	1782	Private	Men	1,621
Washington College	Chestertown, Md.	1782	Private	Coed.	903
Washington State University	Pullman, Wash.	1890	State	Coed.	14,933
Washington University	St. Louis	1853	Private	Coed.	10,806
Wayland Baptist College	Plainview, Tex.	1908	Baptist	Coed.	965
Wayne State College	Wayne, Nebr.	1891	State	Coed.	1,983
Wayne State University	Detroit	1868	State	Coed.	33,909
Waynesburg College	Waynesburg, Pa.	1850	Presbyterian	Coed.	965
Webb Institute of Naval Architecture	Glen Cove, N.Y.	1889	Private	Coed.	83
Weber State College	Ogden, Utah	1889	State	Coed.	8,309
Webster College	St. Louis	1915	Private	Coed.	1,760
Wellesley College	Wellesley, Mass.	1870	Private	Women	1,908
Wells College	Aurora, N.Y.	1868	Private	Women	577
Wesleyan College	Macon, Ga.	1836	Methodist	Women	505
Wesleyan University	Middletown, Conn.	1831	Private	Coed.	1,938
West Chester State College	West Chester, Pa.	1871	State	Coed.	8,186
West Coast University	Los Angeles	1909	Private	Coed.	846
West Florida, University of	Pensacola, Fla.	1967	State	Coed.	4,374
West Georgia College	Carrollton, Ga.	1933	State	Coed.	5,736
West Liberty State College	West Liberty, W.Va.	1837	State	Coed.	2,908
West Texas State University	Canyon, Tex.	1910	State	Coed.	6,791
West Virginia College of Graduate Studies	Institute, W.Va.	1972	State	Coed.	2,368
West Virginia Institute of Technology	Montgomery, W.Va.	1895	State	Coed.	2,527
West Virginia State College	Institute, W.Va.	1891	State	Coed.	3,632
West Virginia University	Morgantown, W.Va.	1867	State	Coed.	19,010
West Virginia Wesleyan College	Buckhannon, W.Va.	1890	Methodist	Coed.	1,619
Westbrook College	Portland, Me.	1831	Private	Coed.	501
Western Baptist Bible College	Salem, Ore.	1955	Private	Coed.	503
Western Connecticut State College	Danbury, Conn.	1904	State	Coed.	4,586
Western Conservative Baptist Seminary	Portland, Ore.	1927	Private	Coed.	382
Western Illinois University	Macomb, Ill.	1899	State	Coed.	15,469
Western Kentucky University	Bowling Green, Ky.	1906	State	Coed.	12,017
Western Maryland College	Westminster, Md.	1867	Methodist	Coed.	2,393

Name	Location	Founded	Control	Student Body	Enrollment
Western Michigan University	Kalamazoo, Mich.	1903	State	Coed.	22,132
Western Montana College	Dillon, Mont.	1893	State	Coed.	701
Western New England College	Springfield, Mass.	1919	Private	Coed.	3,387
Western New Mexico University	Silver City, N.Mex.	1893	State	Coed.	1,597
Western State College of Colorado	Gunnison, Colo.	1901	State	Coed.	3,194
Western Washington State College	Bellingham, Wash.	1933	State	Coed.	8,126
Westfield State College	Westfield, Mass.	1839	State	Coed.	4,937
Westmar College	Le Mars, Iowa	1890	Methodist	Coed.	704
Westminster Choir College	Princeton, N.J.	1926	Private	Coed.	461
Westminster College	Fulton, Mo.	1851	Presbyterian	Men	744
Westminster College	New Wilmington, Pa.	1852	Private	Coed.	2,000
Westminster College	Salt Lake City, Utah	1875	Private	Coed.	851
Westminster Theological Seminary	Philadelphia	1929	Private	Coed.	186
Westmont College	Santa Barbara, Calif.	1940	Private	Coed.	979
Wheaton College	Wheaton, Ill.	1860	Private	Coed.	2,087
Wheaton College	Norton, Mass.	1834	Private	Women	1,294
Wheeling College	Wheeling, W.Va.	1954	Roman Catholic	Coed.	590
Wheelock College	Boston	1888	Private	Coed.	928
White Plains, College of	White Plains, N.Y.	1923	Roman Catholic	Coed.	630
Whitman College	Walla Walla, Wash.	1859	Private	Coed.	1,108
Whittier College	Whittier, Calif.	1901	Private	Coed.	1,431
Whitworth College	Spokane, Wash.	1890	Private	Coed.	1,722
Wichita State University	Wichita, Kans.	1895	State	Coed.	14,766
Widener College	Chester, Pa.	1821	Private	Coed.	2,921
Wilberforce University	Wilberforce, Ohio	1856	Methodist	Coed.	1,143
Wiley College	Marshall, Tex.	1873	Methodist	Coed.	535
Wilkes College	Wilkes-Barre, Pa.	1933	Private	Coed.	3,080
Willamette University	Salem, Ore.	1842	Private	Coed.	1,617
William and Mary, College of	Williamsburg, Va.	1693	State	Coed.	5,559
Christopher Newport College	Newport News, Va.	1968	State	Coed.	2,305
William Carey College	Hattiesburg, Miss.	1906	Baptist	Coed.	1,032
William Jewell College	Liberty, Mo.	1849	Baptist	Coed.	1,246
William Paterson College	Wayne, N.J.	1855	State	Coed.	11,415
William Penn College	Oskaloosa, Iowa	1873	Quaker	Coed.	752
William Woods College	Fulton, Mo.	1870	Private	Women	1,330
Williams College	Williamstown, Mass.	1793	Private	Coed.	1,824
Wilmington College	Wilmington, Ohio	1870	Quaker	Coed.	765
Wilson College	Chambersburg, Pa.	1869	Private	Women	465
Windham College	Putney, Vt.	1960	Private	Coed.	889
Winona State College	Winona, Minn.	1858	State	Coed.	4,533
Winthrop College	Rock Hill, S.C.	1886	State	Coed.	3,769
Wisconsin, University of	Eau Claire, Wis.	1916	State	Coed.	8,888
	Green Bay, Wis.	1969	State	Coed.	3,661
	La Crosse, Wis.	1909	State	Coed.	6,954
	Madison, Wis.	1848	State	Coed.	35,931
	Milwaukee	1956	State	Coed.	24,943
	Oshkosh, Wis.	1871	State	Coed.	10,415
	Platteville, Wis.	1866	State	Coed.	3,821
	River Falls, Wis.	1874	State	Coed.	4,082
	Stevens Point, Wis.	1894	State	Coed.	8,054
	Superior, Wis.	1896	State	Coed.	2,759
	Whitewater, Wis.	1868	State	Coed.	8,144
Parkside Campus	Kenosha-Racine, Wis.	1969	State	Coed.	4,856
Stout Campus	Menomonie, Wis.	1893	State	Coed.	5,227
Wittenberg University	Springfield, Ohio	1845	Lutheran	Coed.	3,121
Wofford College	Spartanburg, S.C.	1854	Methodist	Coed.	1,047
Woodbury University	Los Angeles	1884	Private	Coed.	1,702
Woodstock College	New York City	1869	Roman Catholic	Men	97
Wooster, College of	Wooster, Ohio	1866	Presbyterian	Coed.	1,971
Worcester Polytechnic Institute	Worcester, Mass.	1865	Private	Coed.	2,537
Worcester State College	Worcester, Mass.	1871	State	Coed.	4,233
Wright State University	Dayton, Ohio	1967	State	Coed.	11,624
Wyoming, University of	Laramie, Wyo.	1886	State	Coed.	7,971
Xavier University	Cincinnati, Ohio	1831	Roman Catholic	Coed.	6,259
Xavier University of Louisiana	New Orleans	1925	Roman Catholic	Coed.	1,548
Yale University	New Haven, Conn.	1701	Private	Coed.	8 583
Yankton College	Yankton, S.Dak.	1881	Private	Coed.	397
Yeshiva University	New York City	1886	Private	Coordinate	3,440
York College of Pennsylvania	York, Pa.	1968	Private	Coed.	2,875
Youngstown State University	Youngstown, Ohio	1908	State	Coed.	13,988

dents work during their summer vacations, and others drop out of college for a time to work. Many husbands or wives of students work to help their spouses. Sometimes both husband and wife are students and work part-time.

Financial Help. A student may receive all or part of his college expenses through various aid programs. These programs include scholarships and fellowships; federal, state, and private loan programs; and benefits for veterans and certain other groups such as war orphans. There are so many programs of this kind that almost every college and university has a financial aid office to serve its students. A prospective student who needs financial assistance should consult this office at the schools he is considering. In general, there are enough financial aid programs to make it possible for any person to attend some college or university in spite of financial problems. See FELLOWSHIP; SCHOLARSHIP; GI BILL OF RIGHTS.

Kinds of Universities and Colleges

Universities and colleges in the United States may be classified as (1) those operating under private sponsorship, and (2) those operating under public sponsorship. Private institutions may be church-related or non-sectarian. Public institutions may be sponsored by local government, state government, or the federal government. The military academies are examples of federally supported institutions. Most private liberal arts colleges are church-related, while most privately sponsored universities are not now associated with any church. Most public universities are sponsored by state governments. Most junior or community colleges are sponsored by local governments.

Income. All universities and colleges receive funds from a variety of sources. Private colleges depend primarily on student fees and on endowments and gifts for their operating income. Public institutions also have these sources, but depend mainly on state and local taxes for operating funds. Both public and private institutions may receive federal funds for research activities. The federal government distributes aid among colleges and universities according to various formulas. These formulas are based on the number of students in scholarship and loan programs, and on the enrollment of graduate students and veterans.

Both public and private institutions receive funds for construction from several sources. These sources include federal, state, and local grants or loans; gifts; student fees; and endowments.

Governing Boards. Most universities and colleges are controlled by a *board of trustees* or a *board of regents*. Boards of trustees of private institutions usually elect their own members. The church body may elect the trustees of a church-related institution. The alumni association of a private institution often elects some of the trustees. The trustees of public institutions are usually appointed by the governor of the state. The voters sometimes elect the trustees or regents.

Boards of trustees or regents approve educational policies. They also appoint the chief administrative officer of the institution. In some states, coordinating committees and boards have been established to exercise supervision over those institutions financially assisted by the state.

Most church-related colleges except seminaries admit students of any religious denomination. Some of them expect all students to attend chapel exercise and to study some religious courses. But some colleges apply these rules only to students of the same religious faith.

In the United States, the federal government has encouraged the development of universities and colleges since the time of the Northwest Ordinance of 1787. The Morrill Act of 1862 provided land grants to all states to support colleges that, among other subjects, would teach agriculture and the mechanical arts. In some instances, these land grants were given to existing state universities. In other cases, new institutions were established. Many are now major universities.

Seven Canadian provinces sponsor and support universities. Some provinces have also founded technical, agricultural, and junior colleges. The first provincial university was the University of Toronto. It was founded in 1827 as the University of King's College.

School Organization

Campus is the land on which a college or university stands. The main buildings on a campus usually include classroom buildings, an administration building, a library, laboratories, a gymnasium, an athletic field and stadium, and dormitories. Many institutions have a building, often called a *union*, where social gatherings, plays, and dances may be held. Many of today's universities have more than one campus.

Administration. The organization of state, province, and city-supported institutions is generally about the same as that of other universities and colleges. They usually offer about the same courses of study, although state institutions often emphasize technical and professional education more than private schools.

In most cases, a *president* or *chancellor* is the chief administrator of a university or college. Other officials handle educational programs, registration, management of funds, and collection of tuition. Most institutions have a *dean of students*, who helps direct discipline and advise students.

Each college or separate school of a university generally has an *academic dean* or *director*. He leads the faculty in preparing the course of study of his college or school, and takes part in university planning.

Faculty includes the teachers of a college or university. The faculty of a college is divided into *departments*. Each department deals with one general course of study, such as English, mathematics, or physics. Each department has a *chairman*, who is usually a *professor*. Under him are other professors, *associate professors*, *assistant professors*, and *instructors*. Some departments also have *teaching fellows* or *research fellows*. These are graduate students who teach or do research part time.

Some university faculties include scientists or other research workers who do not teach. Their research is supported by the institution or by funds granted the institution by individuals or groups having specific research interests. Universities and colleges do much research under government contract.

The Student Body of a university or college is divided into graduates and undergraduates. *Graduates* have already received their bachelor's degree and are work-

ing more or less independently for a master's or doctor's degree. *Undergraduates* are studying for their bachelor's degree. The undergraduates belong to one of four classes, according to their year of study. These are the *freshman*, *sophomore*, *junior*, and *senior* classes. Most schools also admit *special students* who take a number of courses, but are not working toward a degree.

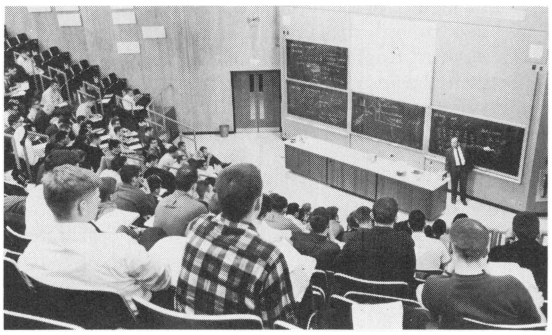
Student bodies vary considerably from campus to campus. Most institutions are *coeducational*, with both men and women students. Others admit students of only one sex. A *coordinate* institution generally has separate men's and women's colleges. They are controlled by the same central authority and are usually located on the same campus or nearby campuses. See COEDUCATION.

The Calendar is the program of a school year. It is divided according to one of three systems. The most common system divides the calendar into two *semesters* of about 16 weeks each. The first semester begins in August or September. The second semester begins in January or early February. The school year ends in May or June with *commencement*, or graduation exercises (see GRADUATION). Many schools also hold a six- to eight-week summer session. By attending school the year around, students may graduate in three years instead of four if they desire.

College calendars may also be arranged according to the *quarter* system. The school year is divided into four quarters of 10, 11, or 12 weeks each. The first quarter begins in the fall. The Christmas holidays come between the first and second quarters, and the spring holidays between the second and third quarters. Many students do not attend the fourth, or summer, quarter. The popularity of the quarter system increased during World War II, when many men wanted to finish college as quickly as possible before entering the armed forces. The *trimester* system divides the school year into three trimesters of about 15 weeks each.

Selecting Courses

Curriculum. The courses given by a college or university are called the school's curriculum. The catalog of the institution outlines the complete curriculum. It gives the requirements for taking each course, as well as the credits given for the course. Each course is designated as giving a specified number of *credits*. These usually equal the number of class hours devoted each week to the course. For example, a course that meets three times a week usually gives three credits for graduation. Schools using the semester calendar require about 120 credits for graduation. Between 30 and 40 of the required credits must be in the student's major subject.



M. E. Warren, Photo Researchers

A Lecture Hall at Rutgers has features typical of today's university and college classrooms. Good lighting and almost perfect acoustical conditions allow students to see and hear all instruction.

Institutions vary considerably in the amount of freedom given students in selecting their courses. Almost all colleges and universities have a certain number of required subjects. Students usually can also choose nonrequired courses called *electives*. Liberal arts colleges usually give a student more opportunity to choose courses than do professional schools. Many institutions have *general education programs* that give courses designed for freshmen and sophomore students. These programs give students a broad range of courses in different fields of knowledge.

When a college freshman registers, he usually indicates the major subject he chooses to study. During the first two years, he takes largely the basic required courses, such as English composition. The last two years are devoted mostly to the student's major. Many schools permit a student to have two major subjects.

Undergraduate Study. The programs of study provided by universities and colleges are divided into undergraduate and graduate levels. Colleges generally do not offer graduate programs, although some may offer the master's degree. An undergraduate program usually requires four years to complete. Some engineering programs and most architectural programs require five years to complete. Undergraduate study may be in the arts and sciences, or in a discipline such as English, economics, chemistry, or zoology. Undergraduate programs may also be given in a professional field such as agriculture, teacher education, or business administration.

Graduate Study may also be in the arts and sciences, or in a profession. It ordinarily begins only after a person has completed undergraduate study. Some professional fields will only admit a student who has completed undergraduate study. This is generally true of medicine, law, dentistry, and theology. Graduate study is more intensive and specialized than undergraduate study. It usually involves more reading, and some research experience. The time required to earn a graduate degree varies. It is usually three years in law and theology, and four years in medicine. Some graduate programs may be completed in one or two years.

Degrees. The bachelor of arts or bachelor of science degree is the common degree for completing a four or five year program. One or two years of graduate study are usually required for the master of arts or master of science degree. A doctor's degree signifies more extensive graduate study. Many institutions also award honorary degrees for outstanding achievement in a profession or in public service. See DEGREE, COLLEGE.

College Life

College life gives the student a welcome measure of independence. But the student should realize that new responsibilities go with this independence. He must balance hard work with recreation, allow enough time and energy for social activities, and learn to use to the best advantage the opportunities offered by the school.

Residence. Most colleges have *residence halls* or *dormitories*. Dormitory life offers many social advantages and opportunities for friendships. Many schools also have student-controlled residences called *cooperatives*. In these, the students can cut expenses by doing their own housework. Students may often live in private homes or apartments approved by the school.

Many students live with their parents and *commute* (travel daily) between home and campus. Some colleges and universities whose campuses are in large cities provide *commuter centers*, where students who commute may spend free time while on campus.

Fraternities and Sororities have houses at many schools. These organizations choose their own members according to the rules set up by the school. Educators do not agree on the value of the fraternity and sorority system. Some approve the social advantages gained by membership in these organizations. Others believe that they tend to dominate college life, and to become undemocratic. Some colleges prohibit social fraternities and sororities on their campuses. See FRATERNITY; SORORITY.

Instruction. The college freshman finds he has much more time to do as he chooses than he had in high school. His classes generally take up only about 15 hours each week, although he may have additional hours of laboratory work. The rest of the time between classes is free for study or recreation.

Most classes are either lecture or discussion groups. In larger institutions, *lectures* may be given to several hundred students at a time, sometimes with the assistance of closed-circuit television. The student should take careful notes on the information given. *Discussion groups* are much smaller. Students often work on individual projects outside of class and report on them to the group.

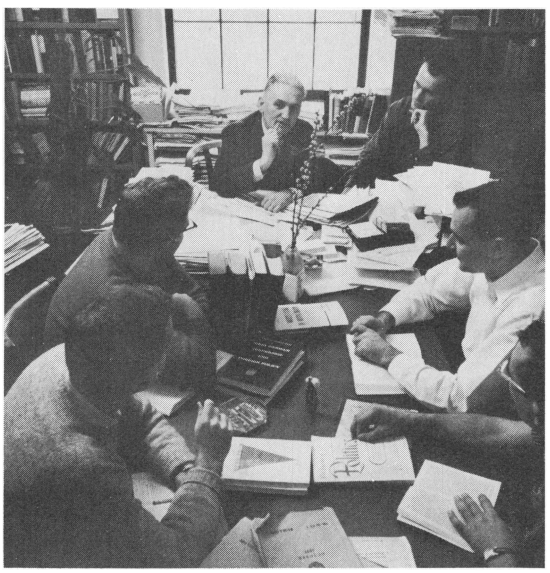
Many universities and colleges offer courses known as *individualized-study* or *self-directed* courses. Such courses have no formal classroom sessions. The student works by himself on assignments outlined by course materials. He completes the assignments at his own pace, under the guidance of a faculty member. In this kind of course work, the student may use computers, individually assigned laboratory booths, and other special learning aids.

For a general discussion of tests and grading, see GRADING; TESTING.

Libraries. University and college libraries are vast storehouses of knowledge. Some hold several million volumes. The library must be used to the fullest extent if the student is to receive the greatest benefit from his college course. At best, routine classwork can only scratch the surface of any field of knowledge. The student can round out his education only by consistent and intelligent independent reading. See LIBRARY (College and University Libraries).

Research and Laboratory Work. The college teacher tries to do more than merely hand the student facts to memorize. It is far more important for him to develop the student's ability to find information for himself and to learn to think intelligently. For this reason, the teacher tries to direct the student in independent study and research by recommending books for outside reading and by suggesting new avenues of study in his field. Students in the sciences and engineering have laboratories in which to work. World-famous scientists direct some of these laboratories. In them they have made many important discoveries, often with the help of graduate students. For example, much of the original work on the use of atomic energy was done in the laboratories of the University of Chicago and the University of California. See RESEARCH.

Extracurricular Activities outside the normal routine of classes and study help develop the student's personality, and provide a proper balance for his daily routine. Athletics are one of many possible activities (see SPORTS AND SPORTSMANSHIP). Students may also work on the staffs of school newspapers and magazines. They may take part in such activities as dramatics, music, writing, hobbies, debating, politics, religion, and student government (see STUDENT GOVERNMENT). These activities are valuable, but the wise student remembers that learning is the main purpose of attending college.



Tom Hollyman, Photo Researchers

Seminars and other discussion groups provide a close relationship between students and instructors. Most seminars offer advanced study and research in specialized areas. This one on international relations is at Wesleyan University, Middletown, Conn.

History

European Universities. Modern universities had their origin in Europe during the 1100's. But European universities were not the first in the world. The Arabs had universities at earlier dates. The University of Al-Azhar, founded in Cairo in about 970, is one of the oldest universities in the world still operating.

European universities developed from the cathedral and monastery schools. Their development took place so slowly that it is difficult to know the point at which they became universities. Many scholars believe the oldest European university is the University of Bologna, Italy. It was founded in the late 1100's, but it had existed as a law school since 890. The University of Paris also developed during the late 1100's. Many other universities appeared in Europe in the 1200's and 1300's.

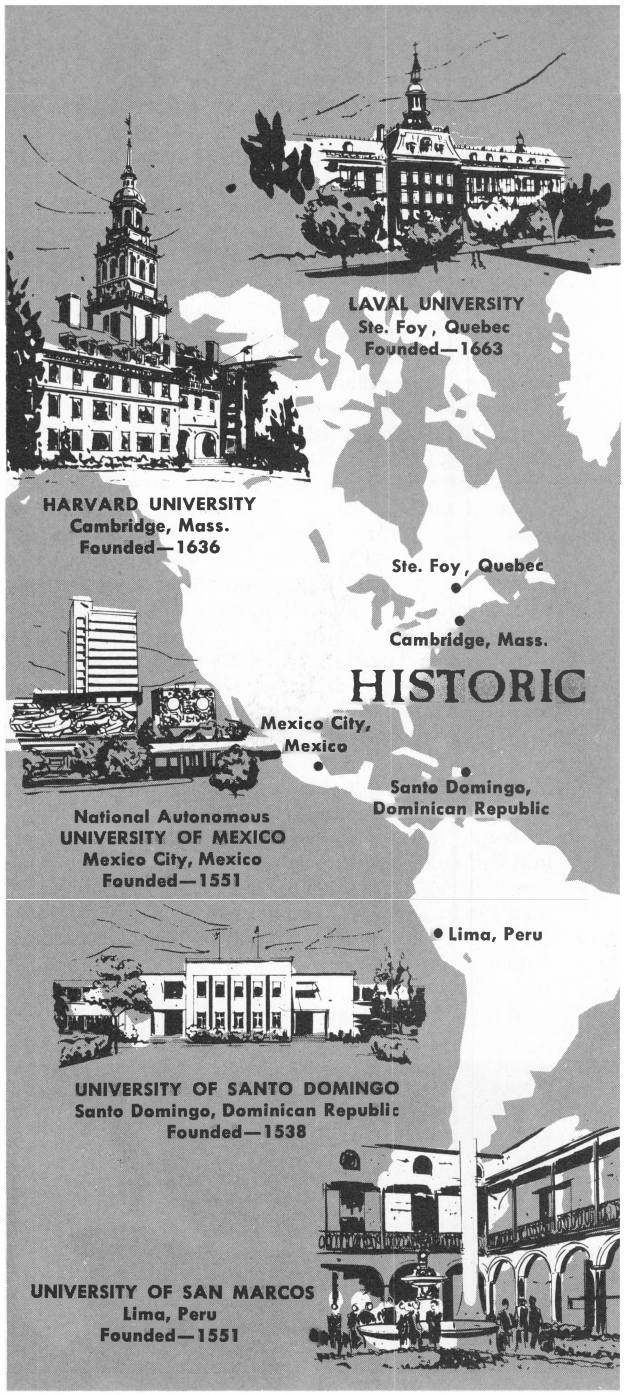
UNIVERSITIES AND COLLEGES

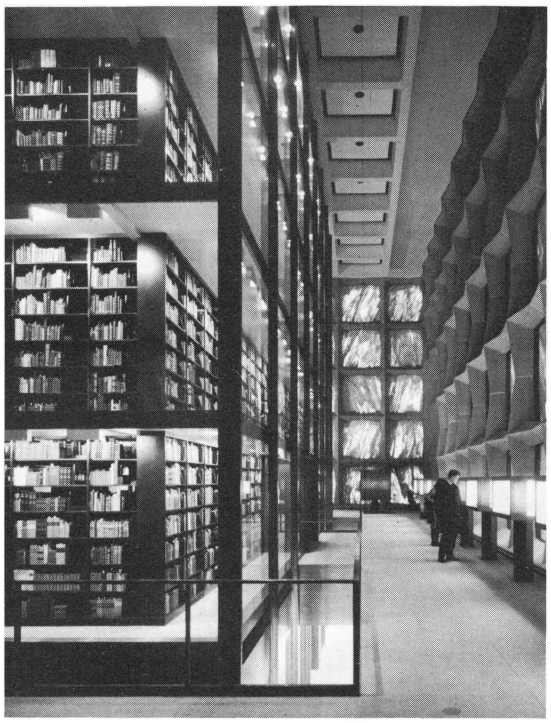
These first schools were founded largely to serve the professions. They provided the first unified teaching of law, medicine, and theology. Most of them were modeled on one of two plans—the Bologna plan or the Paris plan. At Bologna, the university was a corporation of the students. They hired the teachers and controlled the school's policies. The University of Paris was a corporation of the teachers. They collected fees from the students and directed the policies of the university.

Control of the schools gradually passed to a permanent body of administrators. The courses of study also broadened. During the Renaissance in the 1400's, the universities helped direct the revival of interest in Greek and Roman learning. From this revival developed the modern concept of the liberal-arts curriculum.

First Universities in the Americas. The first university in the Western Hemisphere, the University of Santo Domingo, was founded in the Dominican Republic in 1538. The University of San Marcos at Lima, Peru, was founded in 1551, as was the National Autonomous University of Mexico. Other universities appeared shortly afterward in the other Spanish colonies.

The first university to be planned in what is now the United States was at Henricopolis, Va. It was authorized in 1619, but plans were dropped after the Indian massacres of 1622. Harvard University is the oldest school of higher education still active in the United States. It was founded in 1636. The oldest university in Canada, Laval University, was founded as the Seminary of Quebec in 1663. It became a university in 1852.





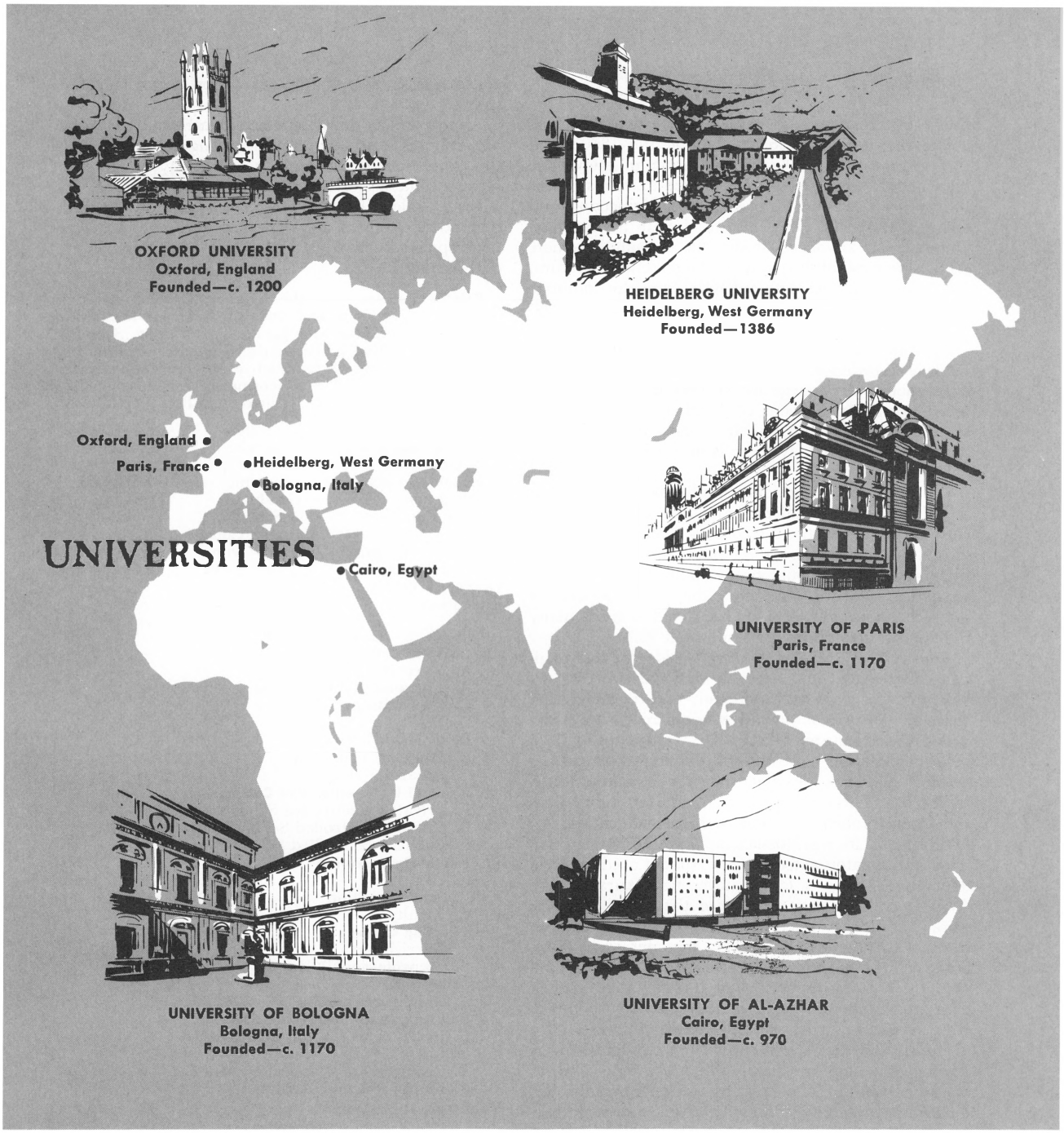
Robert Perron, Photo Researchers

Huge Libraries are important resources of universities and colleges. Visitors to this library at Yale University may view rare books and manuscripts in the display cases, *right*.

The first English-speaking university in Canada was established in 1789. It was the University of King's College at Windsor, N.S.

Higher education in the United States began at a time when knowledge was limited. The modern scientific spirit had not yet developed. The early settlers regarded colleges chiefly as a means of training ministers.

Many of the people who came to America came in search of religious freedom. The influence of this fact may be seen in the development of the American system of higher education. Each faith wanted to train its own leaders, and each set up schools to do so. As a



result, many small church colleges were founded during the 1700's and 1800's, particularly in the Middle West. These colleges were general rather than specialized. They taught liberal arts rather than technical subjects.

Early in American history, some leaders saw the need for education that went beyond the various religious concerns of the people. The state university was one response to this need.

Another development was the granting of land in new territories for the establishment of schools. In addition, wealthy citizens gave gifts for the founding of nonchurch schools. A number of schools which had been estab-

— THE OLDEST U.S. UNIVERSITIES AND COLLEGES —

Name	Location	Year*
Harvard University	Cambridge, Mass.	1636
William and Mary College	Williamsburg, Va.	1693
Yale University	New Haven, Conn.	1701
Princeton University	Princeton, N.J.	1746
Columbia University	New York City	1754
University of Pennsylvania	Philadelphia	1756
Brown University	Providence, R.I.	1764
Rutgers University	New Brunswick, N.J.	1766
Dartmouth College	Hanover, N.H.	1769

*Year institution became a bachelor's degree-granting institution.

lished by churches also came under private control.

Growth of Specialization. During the 1800's and through the mid-1900's, specialization in knowledge increased. Many colleges were created to train students in such fields as agriculture, medicine, engineering, and commerce. Specialization also resulted in an increased emphasis on advanced study. As a result, graduate schools were established at many larger schools. In turn, professional and research interests came to dominate all other educational interests. Education for professions overshadowed the liberal arts.

Specialization has resulted in the multiplying of the fields of knowledge. Educators have been asked to decide whether the college should become a preparatory school for the professions or whether the professional schools should lengthen their courses. Actually, both have happened. Today there is no set idea of what a college should be.

Another cause of specialization has been the increase in the number of students attending college. In the early days, universities served only a relatively limited group. But the people of the United States insisted that higher education should be available to anyone who wanted it. Obviously, the more the college population grew, the more courses had to be offered to satisfy many different individual interests and abilities.

Recent Developments. During World War II, American colleges contributed to the national effort by developing special programs of study and research. After the war, the typical veteran who entered a university was a young man in a hurry. He wanted to obtain a college education or vocational training as quickly as possible, and start the career that had been interrupted by the war. This development brought into sharp focus the whole problem in modern higher education. An additional factor was Russia's rapid postwar advances in science. Educators agree that the student needs a broad education as a basis for whatever field attracts him.

Some colleges now emphasize the study of classic works of literature. Others have combined campus study with practical training in factories and offices. Some colleges have made special studies of the needs of young people to discover what to emphasize in their programs. State universities generally try to use knowledge in as many ways as possible to serve society.

During the 1960's and early 1970's, programs were developed to help members of minority groups obtain a higher education. The federal government established *Upward Bound*, a project designed to encourage and prepare students from low-income homes to attend college. Some schools modified their admissions standards for members of minority groups to encourage their enrollment. Curriculum designers also fashioned new programs, such as Afro-American, American Indian, and Chicano studies. These programs were intended to broaden the student's understanding of the contributions of various ethnic groups to American society.

Other developments centered on the changing role of women in society. The enrollment of women increased in courses leading to professions that had traditionally been considered the work of men. Some colleges developed programs to encourage women to enter such fields as engineering, law, and medicine. In addition, many colleges that had admitted only men began to enroll women.

Another major development in American universities and colleges has been their increasing contribution to the world outside the campus. University laboratories have become important centers of experiment and discovery. College extension services, home study, correspondence courses, and radio and television programs have spread knowledge far beyond the narrow limits of the campus.

JOHN E. CORBALLY, JR.

Related Articles. See the separate articles on outstanding universities and colleges, such as HARVARD UNIVERSITY; WILLIAM AND MARY, COLLEGE OF. See also the Career section in the various articles on different fields of human knowledge, such as MEDICINE (Careers in Medicine); ENGINEERING (Choosing an Engineering Career). Other related articles in WORLD BOOK include:

Academic Freedom
American Association of University Women
Caps and Gowns
Coeducation
College Entrance Examination
Colleges, Association of American
Degree, College
Education
Extension Service
Fellowship
Fraternity
Graduate School
Junior College
Land-Grant College or University
Library
Research
Scholarship
School
Sorority
Teaching
Vocations
Wilson, Woodrow (University President)

Outline

I. Going to College
- A. Selecting a School
- B. Entrance Requirements
- C. Accrediting
- D. Size
- E. College Costs
- F. Working Your Way
- G. Financial Help

II. Kinds of Universities and Colleges
- A. Privately Controlled Schools
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- C. Publicly Controlled Schools

III. School Organization
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- A. Curriculum
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V. College Life
- A. Residence
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- C. Instruction
- D. Libraries
- E. Research and Laboratory Work
- F. Extracurricular Activities

VI. History

Questions

What information should you get when you select a university or college?

How does a university differ from a college?

How is a university faculty usually organized?

In what two ways are school-year programs divided?

In addition to instruction, what opportunities does a university or college offer?

What is the oldest university in the United States? In Canada?

From what sources can a student obtain financial aid?

What kinds of courses did the first universities and colleges in the United States offer? Why?

Why has specialization developed in higher education?

What is the largest university in the United States? In Canada?

UNIVERSITY. For names beginning with University of, see the specific name for entry. For example, for the University of Chicago, see CHICAGO, UNIVERSITY OF.

UNIVERSITY CITY, Mo. (pop. 47,527), is a residential suburb of St. Louis. It lies just west of St. Louis, near the campus of Washington University. For location, see MISSOURI (political map).

University City received its charter in 1906. It has a council-manager form of government. NOEL P. GIST

UNIVERSITY EXTENSION. See CORRESPONDENCE SCHOOL; EXTENSION SERVICE.

UNIVERSITY WITS. See ENGLISH LITERATURE (Elizabethan Drama); GREENE, ROBERT.

UNKNOWN NUMBER. See ALGEBRA.

UNKNOWN SOLDIER. After World War I, officials of the Allied countries found that the bodies of many soldiers killed in battle could not be identified. The governments of Belgium, France, Great Britain, Italy, and the United States decided to honor in some special way the memory of these soldiers. Each government chose a symbolic unknown soldier, buried his remains near the national capital, and built a monument in his honor. Belgium placed its unknown soldier in a tomb at the base of the Colonnade of the Congress in Brussels. France buried its unknown soldier beneath the Arc de Triomphe in the center of Paris, and keeps a flame always burning over the grave. Great Britain buried its unknown soldier in Westminster Abbey. Italy's unknown soldier lies in front of the monument to Victor Emmanuel in Rome.

The Unknown Soldier of the United States was one of four war dead taken from American cemeteries in France. An American soldier, Sergeant Edward Younger, selected him from these four. The remains were brought to the United States Capitol to lie in state. On Armistice Day (Nov. 11), 1921, they were buried in Arlington National Cemetery in Virginia, across the Potomac River from Washington, D.C. The tomb, completed 10 years later, has a white marble sarcophagus over the grave bearing the inscription, "Here rests in honored glory an American soldier known but to God."

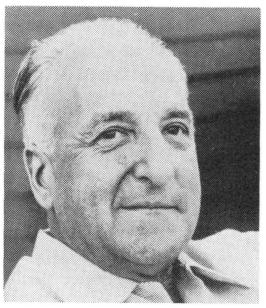
After World War II and the Korean War, Congress directed that an "Unknown American" from each of these wars be buried near or beside the Tomb of the Unknown Soldier. The World War II Unknown was chosen from two unknowns by an American sailor, Hospitalman William Charette, in a ceremony aboard the cruiser *Canberra* off Norfolk, Va. The Korean War Unknown was chosen by an American soldier, Sergeant Ned Lyle, from the unidentified dead of that war buried in the National Memorial Cemetery of the Pacific at Honolulu, Hawaii. These unknowns lay in state at the Capitol. They were buried in marble-capped crypts at the head of the Tomb of the Unknown Soldier on Memorial Day, 1958. Many persons call the memorial the *Tomb of the Unknowns.*

A memorial amphitheater, built by the Grand Army of the Republic in honor of servicemen killed in battle, stands near the tomb. Memorial Day services are held there each year, and wreaths are placed on the tomb. An honor guard from the Honor Guard Company of the 1st Battle Group, 3rd Infantry, Fort Myer, Va., keeps a sentry on duty at the tomb. The sentry is changed every hour during the day and about every two hours at night. His tour of duty averages about 11 months.

Critically reviewed by the DEPARTMENT OF THE ARMY

See also ARC DE TRIOMPHE; ARLINGTON NATIONAL CEMETERY.

UNTERMEYER, *UHN tuhr MY uhr,* **LOUIS** (1885-), is an American poet, critic, and editor. He left school at 15, went into the family jewelry company, and for 23 years worked as a businessman by day and as a writer by night. After he became a vice-president of the company, he resigned to write full time. He went to Europe and lived and studied there for three years. Then he published many volumes of poetry and lectured extensively. He is best known, however, as an anthologist of poetry. He edited about 18 collections of poetry, including *Modern British Poetry* (1920), *Modern American Poetry* (1919), and *Stars to*



Richard L. Simon

Louis Untermeyer

WORLD BOOK photo

The Tomb of the Unknowns in Arlington, Va., honors United States servicemen who have given their lives in war. The bodies of three unidentified servicemen lie buried there. A sentry guards this famous memorial day and night.

Steer By (1941). He also wrote an autobiography *From Another World* (1939). He served as consultant in poetry in English for the Library of Congress. Untermeyer was born in New York City. JAMES WOODRESS

UNTOUCHABLE. See CASTE; INDIA (Religion).

UNWRITTEN LAW. See STATUTE.

UNZHA RIVER. See VOLGA RIVER.

UPANISHADS, *oo PAN ih shadz*, are a group of writings that make up the last section of a collection of Hindu scriptures called the Vedas. The Upanishads form a basic part of Hinduism and have influenced most Indian philosophy.

The Upanishads are sometimes called the *Vedanta*, which means *the summing up of the Veda*. The word *Upanishads* means *to sit close to*. It suggests that this sacred material was originally secret. The Upanishads were composed as dialogues between a teacher and a student. The most important ones appeared between 800 and 600 B.C.

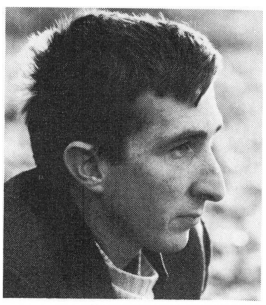
Several important Hindu schools of thought, including the sankhya and yoga schools, were founded on the teachings of the Upanishads. These teachings follow two basic philosophies. One states that there is a single fundamental reality, called *Brahman*, or God, which corresponds to *Atman*, the soul. Thus, there is no real distinction between the soul and God. The other Upanishadic philosophy states that each soul is individually divine. CHARLES S. J. WHITE

See also HINDUISM; VEDAS.

UPAS, *YOO puhs*, is the name of a large forest tree that grows in southeastern Asia and Indonesia. Supposedly, tribesmen mixed its poisonous milky sap with other plant poisons to poison their arrows and darts. Tales about the deadliness of this poison terrified early explorers and travelers in the East Indies. Fabulous but false stories started regarding the poison and the plant producing it. People said that nothing could grow in the shade of the tree. They said the tree brought death to birds that perched on it or flew above it. Some people believed that only persons completely covered with clothes could approach the tree without danger.

Scientific Classification. The upas belongs to the mulberry family, *Moraceae*. It is classified as genus *Antiaris*, species *A. toxicaria*. K. A. ARMSON

UPDIKE, JOHN (1932-), is an American author. His fiction has been praised for its sensitive portrayal of everyday events in a style resembling the work of the Russian writer Anton Chekhov. Many of Updike's novels and stories are set against the background of a small Pennsylvania town resembling his birthplace, Shillington, Pa.



Ivan Massar, Black Star

John Updike

Updike worked on *The New Yorker* magazine from 1955 to 1957 before publishing his first novel, *The Poorhouse Fair* (1959). His next novel, *Rabbit, Run* (1960), concerns a young man who flees from responsibilities imposed on him by society. Updike continued the story in *Rabbit Redux* (1971). *The Centaur* (1963) mixes realism with mythological symbolism. *Couples* (1968) describes the sexual adventures of several New England couples. His other novels include *Of the Farm* (1965), *Bech: A Book* (1970), and *A Month of Sundays* (1975). Updike's stories were collected in *The Same Door* (1959) and *Pigeon Feathers* (1963). His collections of poetry include *Telephone Poles* (1963). ROBERT A. CORRIGAN

UPHOLSTERY. Before the 1400's, people made their chairs and couches comfortable by placing loose cushions at the back and on the seat. During the Italian Renaissance, it became the custom to attach cushions to the frames of the furniture. This new part of the furniture craft was called upholstery.

Today, there are many different ways of upholstering chairs and davenports. Cushions and backs may be filled with down, kapok, cotton, or foam rubber, with the arms of the furniture left bare. Or the backs, sides, and arms of the furniture may be spring-filled and overstuffed with padding. Many people prefer "overstuffed" furniture because it is so comfortable.

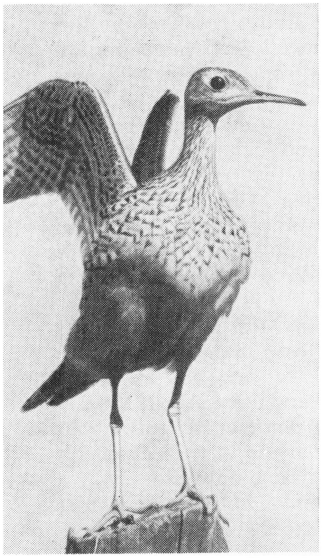
Webbing. In upholstering, strips of linen or jute webbing are first stretched both lengthwise and crosswise of the frame, interlacing at the spots where they cross. The number of webbing strips is determined by the number of springs which are to be used. Enough strips are provided to make one crossing for each spring to rest on. The webbing is usually stretched and tacked to the under sides, so that the stretching will not mar the part of the frame which shows. The tacks which fasten the webbing to the frame are *staggered* (fastened out of line) so as not to split the wood.

Springs. The springs should not be so large as to come in contact with each other when under pressure. But they should be large enough not to leave open spots when someone sits on the furniture. After the springs are placed in position, they are sewed to the webbing to make them secure. Then they are tied down.

Springs are tied down by the row. Twine is passed through the top coils of each row and then fastened to tacks in the frame at either end of the row. The twine is pulled until the springs have been lowered to the desired height above the frame. The less the springs are compressed, the greater the springiness of the upholstery. The springs are then tied with crosswise twines to keep them from tipping from one side to another. Finally, diagonal twines are used to secure the springs even more. The diagonal twines also keep the burlap covering that goes over the springs from slipping.

Stuffing. Burlap is tacked to the furniture frame and sewed to the springs to form a foundation covering for the stuffing which pads the springs. In the best grades of upholstery, curled horsehair or foam rubber forms this padding. The padding is laid evenly over the burlap. If the padding is horsehair, it is sewed down to keep it from shifting and forming holes or lumps. A muslin first covering is sometimes used to hold the padding in place and prevent strain on the upholstery fabric itself.

Fabric. The final step in upholstering is tacking the upholstery fabric to the finished padding work. The upholstery fabric varies greatly, depending on the type of furniture and the fad of the moment. Chintz, satin, and cotton are popular fabrics for bedroom furniture,



Karl H. Maslowski

The Upland Plover helps man by killing harmful insects.

while brocade, silk, and linen are fabrics preferred for living-room furniture. Leather, nylon, and plastics are also excellent upholstery fabrics. EFFA BROWN

See also FURNITURE.

UPLAND PLOVER is a North American bird of the sandpiper family. It is usually found on wet prairies or meadows. It is the only member of the tattler group of sandpipers that does not live by the sea.

The upland plover is sometimes known as the Bartramian sandpiper. It is about 1 foot (30 centimeters) long, and it has an especially long tail for a sandpiper. Its color is blackish-brown and buff above, and buff with dark streaks on the breast and sides. Its belly is white. The upland plover breeds from Alaska to Montana and Maine. In fall, it migrates to southern Brazil and Argentina. There the bird winters on the pampas.

The upland plover makes its nest in clumps of prairie grass or dry leaves on the prairie. The female lays four cream-colored or pale buff eggs, speckled with dark brown. The color of the birds blends with the prairie grass, making the birds difficult to discover. The young birds can fly by midsummer, and start south almost at once.

Upland plovers destroy many harmful insects, such as locusts and cutworms. The birds are protected from hunters by law (see BIRD [Protective Laws]).

Scientific Classification. Upland plovers are in the sandpiper family, *Scolopacidae*, not in the true plover family. Upland plovers are genus *Bartramia*, species *B. longicauda*. GEORGE E. HUDSON

UPOLU. See WESTERN SAMOA.

UPPER CANADA. See ONTARIO (History).

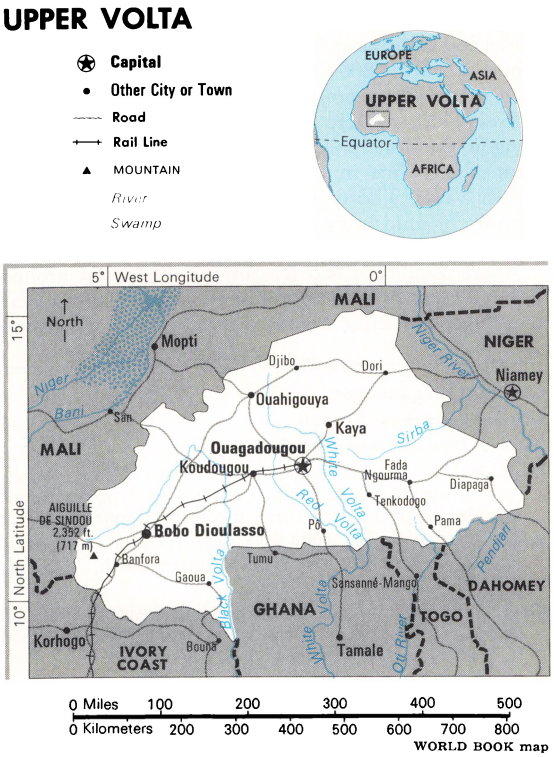
UPPER CANADA VILLAGE. See ONTARIO (Places to Visit).

UPPER DARBY, Pa. (pop. 95,910), is one of the most populous U.S. communities that has kept the township form of government rather than changing to the city form. Its development as a residential community began about 1908 and has been most rapid since 1916. It contains about 20 residential centers. Many of the residents of Upper Darby work or have business interests in Philadelphia, which lies about 10 miles (16 kilometers) north and east. Industrial plants in Upper Darby produce woolen cloth, Turkish towels, chemicals, furniture, communications equipment, and lumber. For location of Upper Darby, see PENNSYLVANIA (political map). S. K. STEVENS

UPPER IOWA UNIVERSITY. See UNIVERSITIES AND COLLEGES (table).

UPPER PALATINATE. See PALATINATE.

UPPER VOLTA



WORLD BOOK map

UPPER VOLTA is an independent country in western Africa. It is slightly larger than the state of Colorado, and it has about $2\frac{1}{2}$ times as many people as that state. It lies about 600 miles (970 kilometers) east of the Atlantic Ocean in the western "bulge" of Africa.

Landlocked Upper Volta is one of Africa's poorest and least developed countries. It consists mostly of wooded, grassy plains atop a plateau. The dry, rocky landscape turns green for only a few months each year. Because the country lacks rich soil and mineral deposits, its people have only the bare necessities of life. Most people are black Africans who make their living by farming and raising cattle.

France governed Upper Volta for 63 years before the country became independent in 1960. Upper Volta's name in French, the official language, is RÉPUBLIQUE DE HAUTE-VOLTA (REPUBLIC OF UPPER VOLTA). Ouagadougou, which has a population of about 115,000, is the capital and largest city.

Government. Military leaders control the government. The president is head of state and head of the government. He also serves as chairman of the 15-member Council of Ministers (cabinet). The president and most of the ministers are army officers.

People belong to one of two main cultural groups, the Voltaic and the Mande. The Voltaic group includes the Mossi, the Bobo, the Gurunsi, and the Lobi

Immanuel Wallerstein, the contributor of this article, is Professor of Sociology at McGill University, and author of Africa: The Politics of Independence.

peoples. The two million Mossi and their relatives, the Yarcé and Gourmantché peoples, are the largest Voltaic group. For over 800 years, they have had a kingdom with a central government headed by the *Moro Naba* (Mossi chief). A Moro Naba still holds court in Ouagadougou, the principal Mossi city. Most of the Mossi are farmers who live in the central and eastern parts of Upper Volta. The typical Mossi family lives in a *yiri*, a group of mud brick huts surrounding a small court. The families keep sheep and goats in the court.

About 275,000 Bobo live in the southwest around Bobo Dioulasso. The Bobo live in large villages where they build castlelike houses with clay brick walls and straw roofs. The 180,000 Gurunsi who live around Koudougou have adopted modern changes more readily than the Mossi have. About 100,000 Lobi live in the Gaoua region. They have long been good hunters and farmers, but now they work as migrant laborers in and around the cities.

The Mande group includes the Samo, Tougan-Marka, Boussance, Senufo, and Dioula peoples. Each of these has from 20,000 to 90,000 members and is a branch of Mande groups living in neighboring Mali, Guinea, and northern Ivory Coast. Upper Volta also has about 270,000 wandering Fulani shepherds, a few Hausa merchants, and about 200,000 nomadic Tuareg herders who live near Dori.

There are about $1\frac{1}{4}$ million Moslems and 220,000 Christians in Upper Volta. Most of the people practice *traditional* (tribal) religions.

Few of the people can read and write. About 125,000 pupils attend Upper Volta's 600 primary schools. About 10,000 students attend secondary and technical schools in larger cities. Upper Volta has no universities.

Land. Upper Volta is a vast inland plateau that varies from 650 to 2,300 feet (198 to 701 meters) or more above sea level. Wooded grassland covers most of the country, but there is a swampy region in the southeast and wooded hills lie in the west.

Rivers have cut many valleys in the plateau. The Black Volta, Red Volta, and White Volta rivers flow south to Ghana's Lake Volta. Small rivers in the east flow into the Niger River. But most of Upper Volta is dry and rocky. The poor, thin soil does not hold water. The 30 to 45 inches (76 to 114 centimeters) of rain that most of Upper Volta gets each year quickly runs off.

Upper Volta's climate is cool and dry from November to February, and hot and dry from March to April. From May to October, it is wet and hot. Average temperatures for most of the year range from 68° to 95° F. (20° to 35° C).

FACTS IN BRIEF

Capital: Ouagadougou.

Official Language: French.

Form of Government: Republic.

Divisions: 10 departments, divided into 44 *sub-prefects* (administrative districts). The national government appoints a prefect to administer each department.

Area: 105,869 sq. mi. (274,200 km²). *Greatest Distances*—east-west, 525 mi. (845 km); north-south, 400 mi. (644 km).

Elevation: *Highest*—Aiguille de Sindou, 2,352 ft. (717 m) above sea level, in the southwest. *Lowest*—about 650 ft. (198 m) above sea level.

Population: *Estimated 1976 Population*—6,097,000; distribution, 96 per cent rural, 4 per cent urban; density, 57 persons per sq. mi. (22 per km²). *1960-1961 Census*—4,300,000. *Estimated 1981 Population*—6,765,000.

Chief Products: Agriculture—corn, cotton, fonio, livestock, millet, peanuts, rice.

Flag: Horizontal black, white, and red stripes stand for the Black, White, and Red Volta rivers. Adopted in 1959. See FLAG (color picture: Flags of Africa).

Money: *Basic Unit*—franc.

Halperin, Monkmeyer

Bobo Dioulasso is the second largest city in Upper Volta. It lies in the southwestern part of the country, where most of the country's Bobo tribesmen live. The tower in the background is on the city's Moslem mosque.

Economy. Cattle raising is the most important activity in Upper Volta's economy. The country's herdsmen have about 2 million each of cattle, goats, and pigs, and about a million sheep. Livestock exports make up from a third to a half of the export income. Most farmland is in river valleys. Farmers use almost all of it to raise such food crops as corn, millet, rice, and *fonio*. Fonio is a crab grass with seeds that are used as a cereal. Peanuts and cotton are the main cash crops.

Upper Volta exports livestock to the Ivory Coast and Ghana, and peanuts and cotton to France. It imports food and agricultural equipment from France and other European Community members. Many of Upper Volta's young men go to Ghana and the Ivory Coast to work for two or three years on cocoa and coffee plantations and as laborers in the cities. The money they send home is an important part of Upper Volta's income.

A railroad, 713 miles (1,147 kilometers) long, connects Ouagadougou with Abidjan, Ivory Coast. Upper Volta's 10,300 miles (16,580 kilometers) of roads include 1,100 miles (1,770 kilometers) of paved highways. Ouagadougou and Bobo Dioulasso have major airports.

History. The Mossi have the longest history of any people in Upper Volta. The Mossi of the Yatenga region, northwest of Ouagadougou, set up a well-organized kingdom in the 1300's. They moved their capital to Ouagadougou in the mid-1400's. They had a strong military force and fought off powerful Songhai invaders from what is now Mali in the 1500's. But the attacks weakened the Mossi kingdom and it began to decline.

Most Europeans did not learn of the Mossi kingdom until the 1800's. France captured Ouagadougou in January, 1897, and the Moro Naba placed the Mossi kingdom under French protection. In 1919, France created the colony of Upper Volta, then dismantled it in 1932 and divided its territory among three other French colonies—Ivory Coast, French Sudan (now Mali), and Niger. France re-created Upper Volta with its pre-1932 boundaries in 1947.

Upper Volta's independence movement began later than similar movements in neighboring French colonies. Many political parties were formed to represent the Mossi, Bobo, and other peoples. The African Democratic Rally Party (ADR), led by Ouezzin Coulibaly, became the largest. In 1957, Coulibaly became head of Upper Volta's first largely independent government.

Upper Volta became a self-governing state within the French Community in 1958. Coulibaly died in 1958, and Maurice Yaméogo took his place. In 1959, Upper Volta joined Dahomey, Ivory Coast, and Niger in the Council of the Entente, an organization formed to solve regional economic and social problems.

On Aug. 5, 1960, Upper Volta became an independent republic with Yaméogo as president and head of the ADR, soon the country's only legal political party. By January, 1966, the people had become dissatisfied with Yaméogo's one-man rule. A general strike by trade union workers protested wage reductions proposed by the government and governmental dishonesty. During the strike, the army took control of the government. General Sangoule Lamizana became head of the military government.

In 1970, voters approved a new constitution and elected a legislature. Lamizana remained as president. In 1971, he appointed a civilian prime minister. But in 1974, Lamizana suspended the constitution, abolished the office of prime minister, and dissolved the legislature. He continued to rule with the assistance of a cabinet made up largely of military officers.

During the early 1970's, a severe drought caused widespread hardship in Upper Volta. The production of crops and livestock in the country was sharply reduced. IMMANUEL WALLERSTEIN

See also FRENCH WEST AFRICA; OUAGADOUGOU.

UPPSALA, UNIVERSITY OF. See SWEDEN (Education).

UPSTATE MEDICAL CENTER. See UNIVERSITIES AND COLLEGES (table: [New York, State University of]).

UR, *oor*, was a city in ancient Sumer, a region in southern Mesopotamia (now Iraq). Ur originally was a harbor city on the Euphrates River near the Persian Gulf. But the site is now isolated, because the river has changed its course. Before 2000 B.C., Ur was one of the most important Sumerian city-states. For a time it controlled all others. The Bible says that the Hebrew leader Abraham came from Ur. The city was the center of production for products made of metals and precious stones. Several such items have been found in tombs there. See also BABYLONIA; CITY (picture); SCULPTURE (The Beginnings [picture]). JOHN WILLIAM SNYDER

URAL MOUNTAINS extend for 1,500 miles (2,410 kilometers) through western Russia. They run in a north-south direction from the Arctic Circle to near the Aral Sea. Many geographers consider them to be one of the boundaries between Europe and Asia. See RUSSIA (physical map).

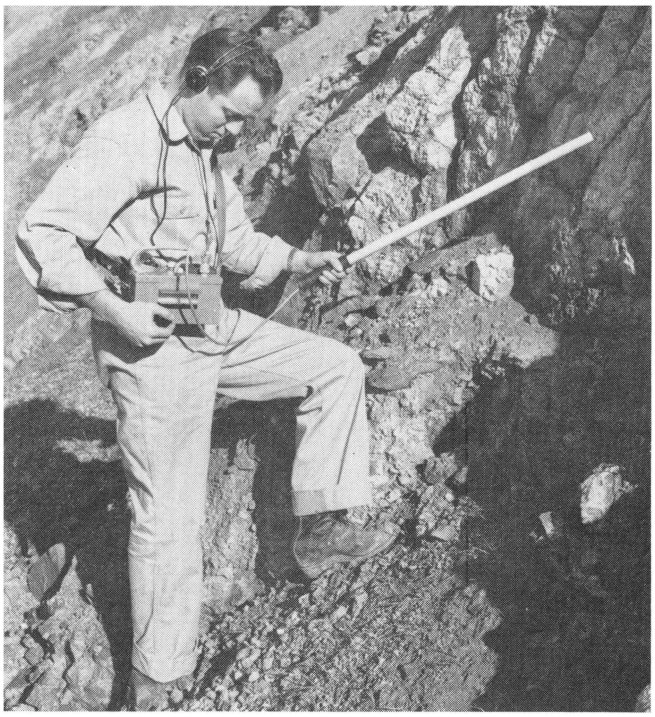
The industrial and mineral development of the Ural Mountains played an important part in supplying the armies of Russia during World War II. These mountains are remarkable in the variety and amount of mineral wealth which they contain. Salt, silver, and gold have been mined in the Ural Mountains since the 1500's. By the 1800's, the Ural region was famous for its gems and semiprecious stones, which include emerald, beryl, amethyst, topaz, and sapphire. Other mining activities produce aluminum, chromium, coal, cobalt, copper, diamonds, iron ore, magnesium, nickel, platinum, and potash. Oil is found west of the Urals, and new gas and oil fields have been developed on the northeastern sides of the mountains. The Urals also have one of the world's largest reserves of asbestos.

The mountains are geologically old. They were formed about 225 million years ago, at the end of the Paleozoic Era. Since then, they have been worn down to rounded hills, most of which rise only from 1,000 to 6,000 feet (300 to 1,800 meters). The highest peak of the Ural Mountains is Mount Narodnaya (6,214 feet, or 1,894 meters). THEODORE SHABAD

URAL RIVER is a shallow stream that rises on the eastern slopes of the southern Ural Mountains in Russia. For location, see RUSSIA (physical map). The Ural flows south for about 1,570 miles (2,527 kilometers) and enters the Caspian Sea through several mouths. Salmon and sturgeon fisheries are along the Ural. Railroads cross it at Orenburg and Ural'sk. The steel center, Magnitogorsk, lies on the upper Ural. THEODORE SHABAD

URANIA. See MUSE.

URANINITE. See PITCHBLENDE.



Fisher Research Laboratory Inc.

Uranium Prospectors use portable Geiger counters to search in rocks for uranium ore. The aluminum prospecting stick on this model works well when exploring deep crevices.

URANIUM, *yoo RAY nih um* (chemical symbol U), is the main source of atomic energy, produced by the *fission* (splitting) of atoms (see FISSION). It has the highest atomic weight of any element found in nature. Its atomic number is 92 and its atomic weight is 238.03. Uranium is *radioactive* (gives off nuclear particles).

Martin Klaproth of Germany discovered an oxide of uranium in the mineral *pitchblende* in 1789. He named the element in honor of the discovery of the planet Uranus. The element was not isolated until 1842.

Uranium is not a rare mineral. It is more common in the earth than such "common" elements as mercury, silver, and iodine. But the concentration of uranium in most rocks is only a few parts in a million.

Uranium Ores

The richest uranium ore, pitchblende, contains uranium oxides. It is a dark bluish-black mineral with a pitchlike luster. The most important ore found in the United States is *carnotite*, a compound of uranium with vanadium, potassium, and oxygen. See CARNOTITE.

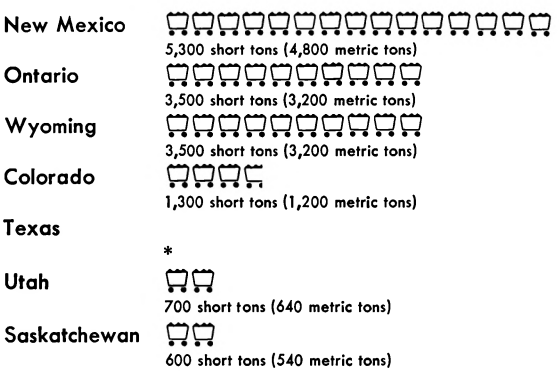
Uranium Deposits. Few high-grade deposits of uranium were known before World War II. The only ones actively mined were the rich pitchblende deposits of the Belgian Congo (now Zaire) and the Great Bear Lake area in northern Canada. These deposits were mined for the radium, silver, and other valuable metals found together with the uranium.

Due to its importance as a source of atomic energy, uranium has been vigorously sought since the end of World War II. In the early 1970's, experts estimated that there are about 1 million short tons (910,000 metric tons) of uranium ore in the world that could be mined. Large amounts also exist in shale and phosphate deposits, in granites, and in the ocean, but cannot be recovered at a reasonable cost. The leading countries in uranium ore reserves are Australia, Canada, France, South Africa, and the United States. In the early 1970's, non-Communist countries produced a total of about 25,000 short tons (22,700 metric tons) of uranium oxide a year. Over half of this amount came from the United States. Experts estimated that Communist countries, including Russia, China, and East Germany, produce from 13,000 to 26,000 short tons (11,800 to 23,600 metric tons) of uranium oxide a year.

In the United States, principal deposits lie in the Western states. The leading uranium-producing states are Colorado, New Mexico, Texas, Utah, and Wyoming. Many deposits in the United States are not of the highest concentration. But the area has been so thoroughly prospected that the United States ranks as

LEADING URANIUM-PRODUCING STATES AND PROVINCES

Tons of uranium oxide produced in 1971

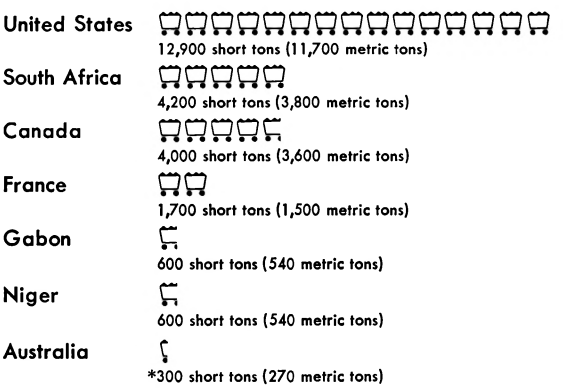


*The U.S. Bureau of Mines ranks Texas fourth among the states but does not report its production to avoid disclosing individual company confidential data.

Sources: U.S. Bureau of Mines; Statistics Canada

LEADING URANIUM-PRODUCING COUNTRIES

Tons of uranium oxide produced in 1971



Figures for Communist countries not available.

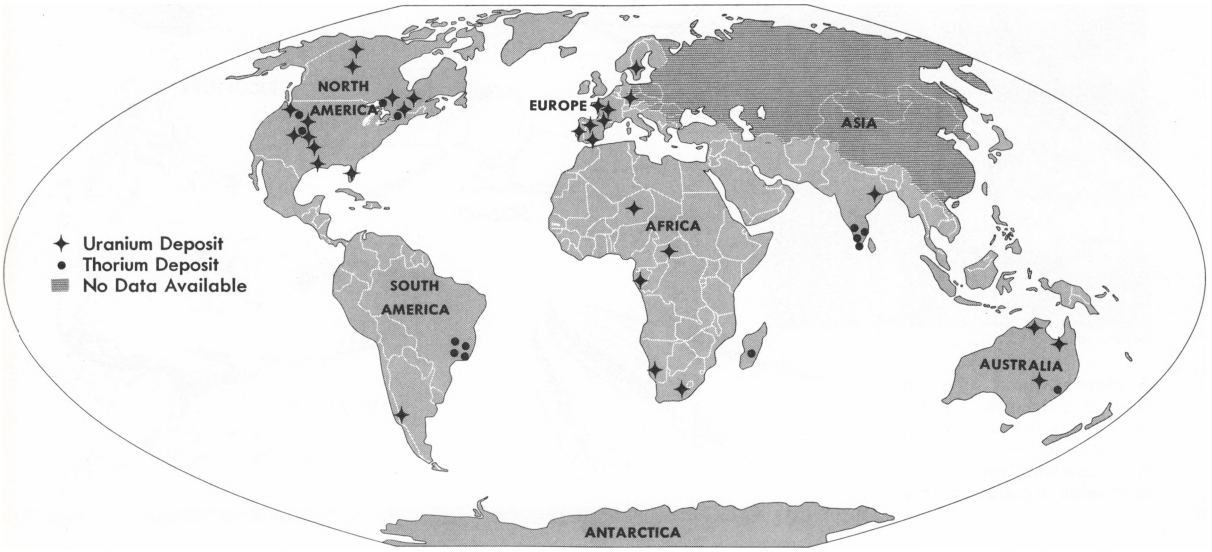
*Estimate.

Source: U.S. Bureau of Mines

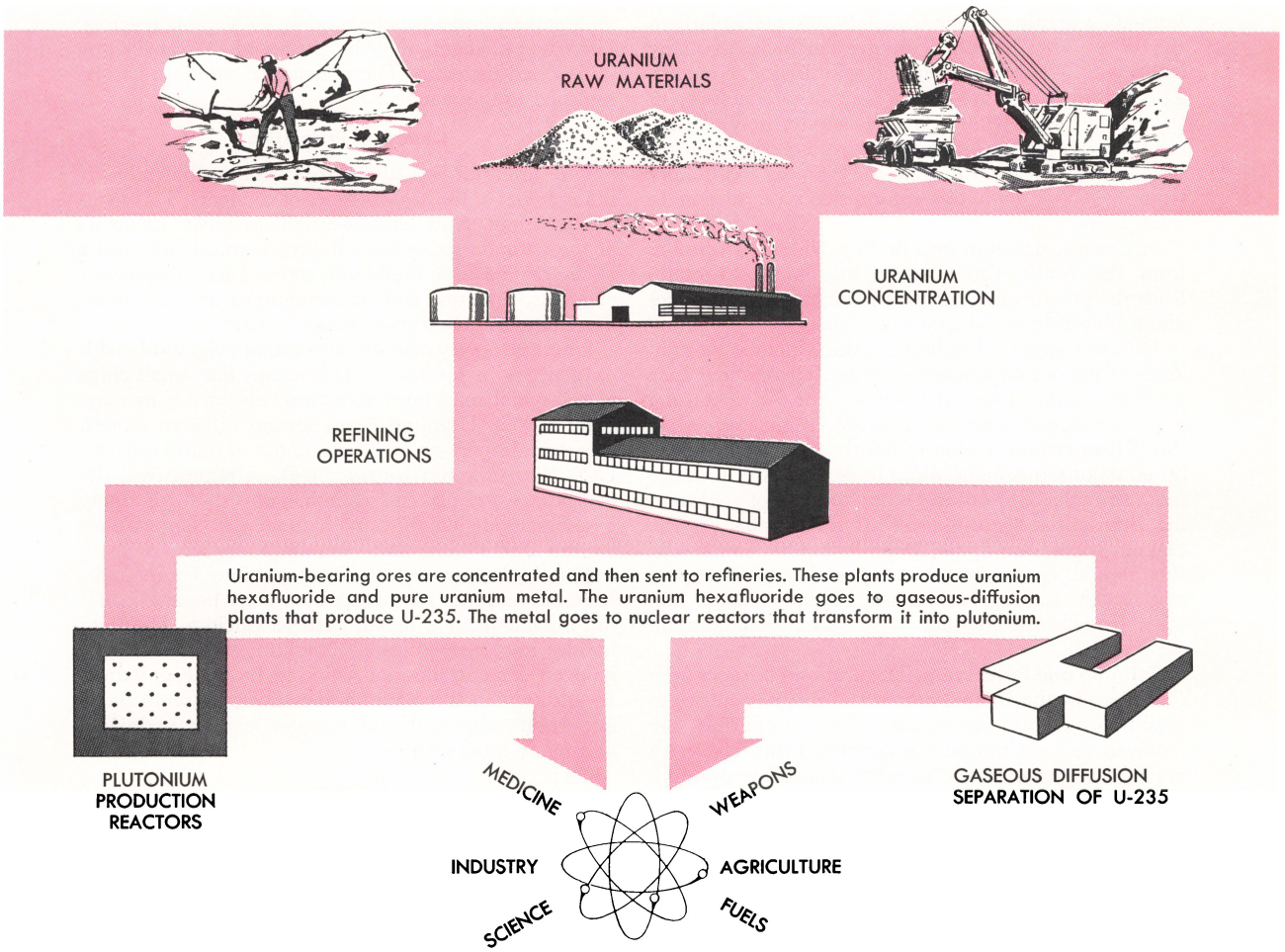
WHERE URANIUM AND THORIUM COME FROM

(Uranium-233 can be made from thorium)

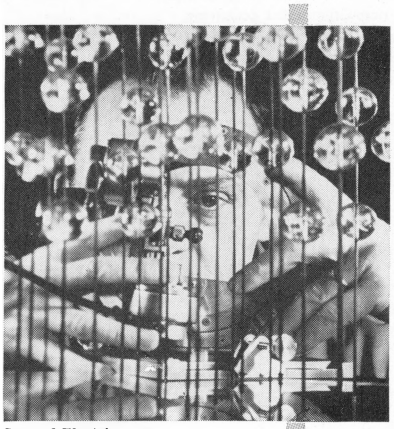
This map locates the major uranium and thorium deposits in non-Communist countries. No information is available on deposits in Communist countries. Australia, Canada, South Africa, and the United States have the largest uranium deposits in the non-Communist world. India, Canada, and the United States lead in thorium deposits.



WORLD BOOK map

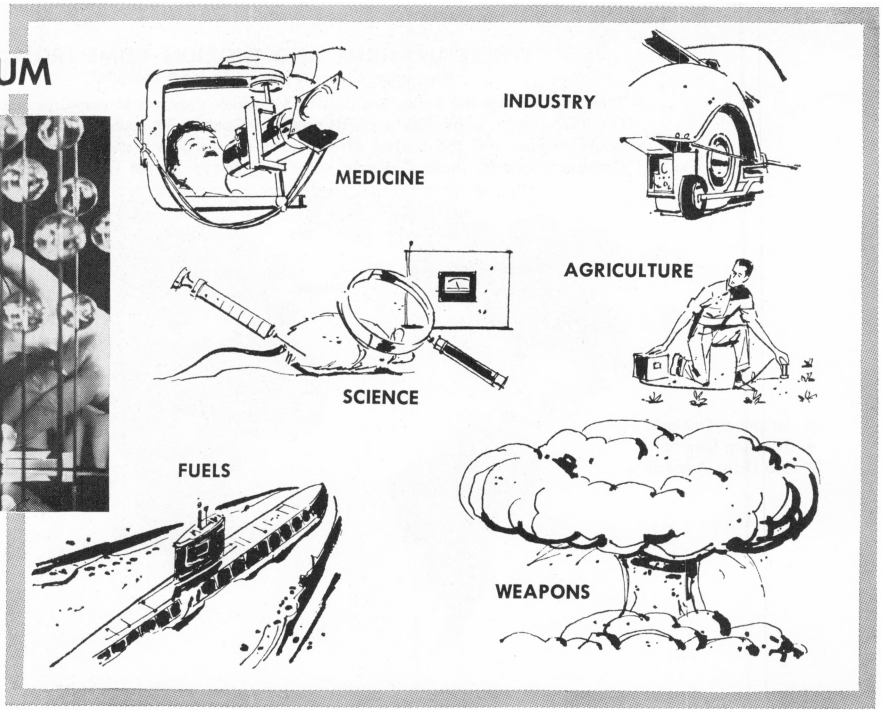


USES OF URANIUM



General Electric

A Plastic Model of a uranium crystal helps scientists study and understand the structural changes that take place in uranium when under intense heat inside a nuclear reactor.



a major uranium-producing country. In the 1950's, many prospectors, both professional and amateur, hunted for uranium in the United States, particularly in the West. They searched among the rocks in many areas with Geiger counters or scintillation counters. These devices indicate the amount of radioactivity in the rocks. Places with high radioactivity may contain uranium ores. In the United States, minerals and ores of uranium may be sold only to the Nuclear Regulatory Commission or with the commission's permission to other users.

In Canada, uranium ores lie in a wide belt running from the Arctic Circle south to Ontario. Ontario leads the provinces in uranium production. It produces about four-fifths of Canada's uranium.

In Other Countries. Deposits in Africa include those in Zaire at the rich Shinkolobwe mines. These mines once produced almost pure pitchblende. But the richest deposits are largely used up. The gold mines located in the Witwatersrand region of South Africa rank as another major source of uranium in Africa. They produce large amounts of uranium as a by-product of gold mining. Substantial deposits also exist in Australia, France, Gabon, Niger, and Spain. Deposits in Czechoslovakia, the original source of most of the world's uranium, are still mined. Experts believe that China, Russia, and other Communist countries have substantial uranium deposits.

Refining and Processing. The uranium ore goes from the mines in the United States and other countries to uranium-concentrating plants. There, impurities are removed and the uranium is converted into U_3O_8, an oxide of uranium. Then, in other plants, the uranium oxide is refined to either a metal powder of pure uranium or the compound uranium hexafluoride, UF_6. The uranium metal may be used in nuclear reactors to produce plutonium. The UF_6 goes to *gaseous diffusion* plants. There, the compound is *vaporized* (changed into a gas) and the atoms of uranium of different weight are separated. The highly fissionable uranium is used for weapons and as fuel elements for various reactors. Used fuel elements may be processed to recover any unfissioned uranium. The unfissioned uranium can be returned to the reactor.

Chemical Properties

Pure uranium is a silvery metal, softer than iron. It is a member of the *actinide* series of elements. This series has actinium as its lightest-weight member. Elements of the actinide series have many chemical similarities to the *rare earth*, or *lanthanide*, series. Like other heavy elements, uranium and its compounds are poisonous. See ELEMENT, CHEMICAL; RARE EARTH.

Uranium is very reactive. It combines vigorously with oxygen, and is *pyrophoric*. This means that small chips of the metal may burn spontaneously in air, as magnesium does. Uranium forms several different oxides. The most important in chemistry are uranium dioxide, UO_2, and uranium trioxide, UO_3. Uranium will decompose water. It can combine directly with many gases, including chlorine and hydrogen, at temperatures around 200° C. Metallic uranium reacts with acids to release hydrogen and to form uranium compounds. Metallic uranium may be produced by heating a uranium *halide* with a metal, such as calcium. Uranium halides are compounds of uranium with one of the halogen elements: fluorine, chlorine, bromine, or iodine. In addition to the oxides and halides, uranium forms important compounds with nitrogen, carbon, hydrogen, and many other elements.

Isotopes

As found in nature, uranium consists of a mixture of three isotopes. *Isotopes* are atoms of an element that have the same atomic number but different atomic weights or mass numbers. The uranium isotope with the

atomic mass 238, written U^{238}, makes up 99.274 per cent of naturally occurring uranium. The other two isotopes, U^{235} and U^{234}, make up 0.72 per cent and 0.006 per cent, respectively, of the uranium. All of these isotopes are *radioactive*. They decay by giving off alpha particles to form isotopes of the element thorium (see ALPHA RAY; THORIUM). Thorium is also radioactive, and forms radioactive decay products. The decay of these isotopes finally ends in stable isotopes of lead.

Isotope Separation. The main method of separating the various isotopes of uranium is called the *gaseous diffusion* method. In this method, uranium is used in the form of uranium hexafluoride, UF_6, which *vaporizes* (becomes a gas) easily. Since fluorine has only one isotope, any variation in molecular weight depends completely on the weight of the uranium isotope in the molecule. Molecules of lower weight containing U^{235} move slightly faster than heavier molecules, which contain U^{238}. Therefore, the lighter molecules will pass slightly more easily through a very narrow passage, such as the holes in a porous material. Thus, in each passage through a porous barrier, a slight separation of the isotopes occurs. If this is repeated many hundreds of times, the isotopes become separated. Factories in the United States and other countries use this method to produce many tons of *enriched* uranium (uranium with a high U^{235} content). The U^{235} isotope is the only naturally occurring uranium isotope that fissions easily.

Artificially Made Isotopes. In addition to the three naturally occurring isotopes, U^{234}, U^{235}, and U^{238}, other isotopes of uranium may be produced in the laboratory. They are all radioactive. These isotopes range in atomic mass from U^{227} to U^{240}. One of them, U^{233}, will fission easily, in the same way as U^{235}.

U^{233} is produced by bombarding thorium 232 atoms (Th^{232}) with neutrons in a nuclear reactor. The Th^{232} captures a neutron to form Th^{233}. Th^{233} then decays by losing a beta particle (an electron) to form protactinium 233. The protactinium is also radioactive, and decays by losing a beta particle to form U^{233}. See BETA RAY; TRANSMUTATION OF ELEMENTS.

Uranium Fission

Fission (splitting) of the uranium atom results in the release of energy. When a neutron hits a uranium atom, the atom breaks up into two smaller atoms, each about half as heavy as the original uranium atom. Two or three neutrons are released. But the combined weight of the *fission fragments* (smaller atoms) and the neutrons amounts to less than the weight of the original uranium atom and the neutron that hit it. This "lost" mass is converted into energy. In 1905, Albert Einstein explained that mass might be changed into energy according to the formula $E=mc^2$. In this formula, E stands for energy, m stands for mass, and c^2 stands for the speed of light *squared* (multiplied by itself). Thus, a small amount of mass converted into energy results in a huge amount of energy. See NUCLEAR ENERGY (The Science of Nuclear Energy).

U^{235} is the only naturally occurring isotope of uranium that can fission when bombarded by *slow* (low-energy) neutrons. When a slow neutron hits the U^{235} atom, it is captured by the *nucleus* (core) of the atom. This forms an atom of uranium with a higher atomic mass—U^{236}. This unstable nucleus splits into two smaller nuclei, releasing neutrons and energy. One pound (0.45 kilogram) of pure U^{235}, if completely fissioned, would yield energy equal to that of an explosion of 9,000 short tons (8,200 metric tons) of TNT.

When U^{238} atoms capture slow neutrons, they form atoms of U^{239}. But these atoms do not fission. Bombardment of U^{238} with *fast* (high-energy) neutrons will cause fission.

Chain Reaction. Only one neutron is needed to split an atom of uranium, and each fission releases two or three neutrons. These neutrons can then fission other atoms of uranium. Thus, a *chain reaction* is possible. In a chain reaction, once fission begins it will continue without anything being added to the system. Since U^{238} captures slow neutrons but does not fission, it hinders the chain reaction. Thus it is important to separate the U^{235} from the comparatively inert U^{238} for use in atomic weapons and in many nuclear reactors. But reactors can use fuels that range from natural uranium to material highly enriched in U^{235}, or in the artificially produced fuels, plutonium 239 (Pu^{239}) and U^{233}. The type of fuel used depends on the type of reactor. See NUCLEAR REACTOR; NUCLEAR ENERGY.

Breeder Reactions in nuclear reactors produce both fissionable material and atomic energy. An efficient breeder reactor may some day produce more fissionable material than it consumes.

In a breeder reactor, the fuel used to operate the atomic power plant is U^{235}. Fission of U^{235} produces energy. Neutrons released from U^{235} fission keep the chain reaction running. But some of them are captured by U^{238} and change it into U^{239}. The U^{239} decays by beta radiation into neptunium 239. The neptunium in turn decays by beta radiation into Pu^{239}, which is fissionable material. In an efficient reactor, the Pu^{239} produced should at least equal the U^{235} used up. U^{238} can be used to produce Pu^{239}, with Pu^{239} used as the fissionable material. Th^{232} can be used to produce U^{233}, also a fissionable material. ROBERT L. THORNTON

Related Articles in WORLD BOOK include:

Atomic Bomb	Prospecting (picture)
Isotope	Radioactivity
Plutonium	U-235

URANIUM CITY, Sask. (pop. 1,867), lies in the center of some of the world's richest uranium deposits. It is on the north shore of Lake Athabasca. For location, see SASKATCHEWAN (political map). The settlement was laid out by the provincial government in the early 1950's, after uranium was discovered in the area. The provincial government administers it.

URANUS, *YUR uh nuhs* or *yu RAY nuhs*, was the earliest god of the sky in Greek and Roman mythology. He was the son and husband of Gaea, the earth. Uranus and Gaea were the parents of the Titans, the first race of mythological beings.

Uranus feared his children and confined them deep within their mother, the earth, immediately after their birth. Gaea plotted revenge for their imprisonment. With her help, Cronus, the youngest Titan, attacked Uranus while he slept. Cronus wounded Uranus with a sickle and made him unable to father any more children. Because of his wound, Uranus became separated forever from Gaea. The Greeks and Romans used this

myth to explain the separation of the earth from the sky.

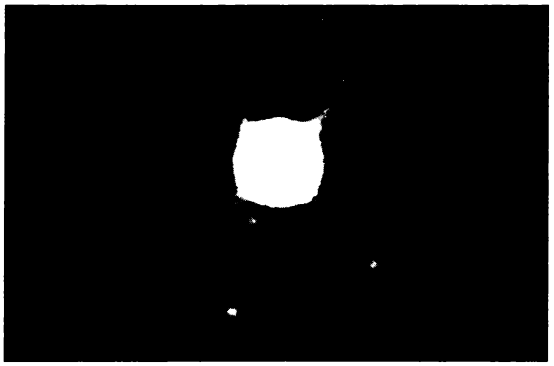
After being separated from Gaea, Uranus played little part in mythology. His functions as god of the sky were taken over by his grandson, called Zeus by the Greeks and Jupiter by the Romans. C. SCOTT LITTLETON

See also MYTHOLOGY (Greek Mythology); TITANS.

URANUS, *YUR ruh nus,* is the seventh planet from the sun. Only Neptune and Pluto are farther away. Uranus has a diameter of about 29,000 miles (46,700 kilometers), which is almost four times the diameter of the earth.

Uranus travels around the sun in an oval-shaped orbit. Its mean distance from the sun is about 1,785,000,000 miles (2,872,700,000 kilometers). The planet takes about 84 earth-years to go around the sun. At its closest approach to the earth, Uranus is about 1,700,000,000 miles (2,740,000,000 kilometers) away.

As it orbits the sun, Uranus rotates on its *axis,* an imaginary line through its center. The axes of most planets are almost *perpendicular* (at an angle of 90°) to the planets' paths around the sun. But the axis of Uranus is tilted 98° from the perpendicular position, so that it is almost level with the planet's path around the sun. Uranus takes 10 hours and 49 minutes to spin around on its axis. The large angle of tilt and the rapid spinning of the planet make it appear to roll along in its orbit. See PLANET (illustration: The Axes of the Planets.

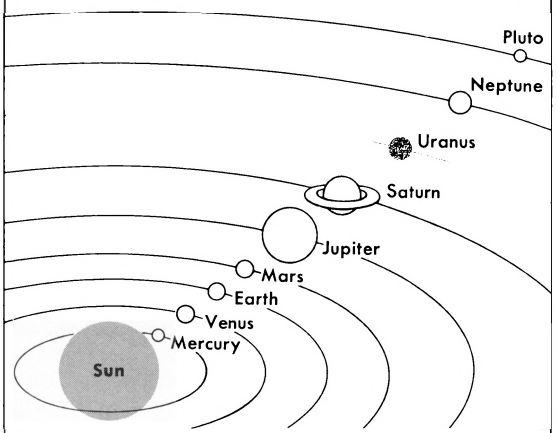


Lowell Observatory

Four of Uranus' Five Satellites formed a triangle directly below the planet when this picture was taken. The rays of light that seem to come from the edges of the planet are created when light from Uranus is scattered by the earth's atmosphere.

URANUS AT A GLANCE

Uranus, shown in blue in the diagram, is the seventh closest planet to the sun. Astronomers still use the ancient symbol for Uranus, *right.*



Distance from Sun: *Shortest*—1,700,000,000 mi. (2,740,000,000 km); *Greatest*—1,870,000,000 mi. (3,009,000,000 km); *Mean*—1,785,000,000 mi. (2,872,700,000 km).

Distance from Earth: *Shortest*—1,700,000,000 mi. (2,740,000,000 km); *Greatest*—1,960,000,000 mi. (3,154,000,000 km).

Diameter: About 29,000 mi. (46,700 km).

Length of Year: About 84 earth-years.

Rotation Period: 10 hours and 49 minutes.

Average Temperature: —240° F. (—151° C).

Atmosphere: Hydrogen, helium, methane.

Number of Satellites: Five.

Astronomers know little about the surface of Uranus. The planet appears to be surrounded by clouds. Uranus was the first planet discovered by a known astronomer. Sir William Herschel of England found it in 1781. Five small *satellites* (moons) move around the planet. HYRON SPINRAD

See also PLANET; SOLAR SYSTEM.

URBAN was the name of eight popes of the Roman Catholic Church. Urban II and Urban VIII were the most important. The group, and the years they served, includes:

Urban I, Saint	(222-230)	Urban V	(1362-1370)
Urban II	(1088-1099)	Urban VI	(1378-1389)
Urban III	(1185-1187)	Urban VII	(1590)
Urban IV	(1261-1264)	Urban VIII	(1623-1644)

Urban II (1042?-1099), a Frenchman, vigorously supported the Cluniac reform movement within the Roman Catholic Church. Pope Urban was opposed by Guibert of Ravenna, the antipope who called himself *Clement III,* a candidate of Emperor Henry IV of Germany. Urban was successful against Clement III and the emperor. He presided at the Council of Clermont in 1095. There, he gave one of the most effective talks in history, in which he called Christians to a crusade to take the Holy Land from the Turks. The cry, "God wills it!" at the conclusion of his speech inaugurated the First Crusade (see CRUSADES). The crusaders drove Clement III from Rome. Then, they established Urban on the papal throne before going to Jerusalem.

Under Urban's direction, the Council of Clermont issued a number of strict reform decrees, deposed the emperor's nominee for the see of Cambrai, excommunicated the king of France for adultery, and extended the Truce of God to all Christendom. Urban was born in the province of Champagne, in France.

Urban VIII (1568-1644) was pope during the greater part of the Thirty Years' War (1618-1648). He held foremost the welfare of the Roman Catholic Church. Urban founded an international seminary to train priests for the missions.

In 1633, Urban opened China and Japan as mission

territory for all religious orders. Urban was born in Florence, Italy. THOMAS P. NEILL and FULTON J. SHEEN

URBAN AFFAIRS, COUNCIL FOR, was a U.S. government advisory group that helped the President develop and carry out domestic policies, especially those concerning the nation's cities. It worked to develop a national urban policy and to gain cooperation among the federal, state, and local governments to help carry out its programs.

The council was established in 1969. In 1970, it was replaced by the Domestic Council, an agency that assists the President in setting domestic priorities and policies. Members of the Council for Urban Affairs included the President; Vice-President; attorney general; the secretaries of agriculture, commerce, labor, transportation, housing and urban development, and health, education, and welfare; and other heads of departments and agencies whom the President could appoint from time to time.

Critically reviewed by the COUNCIL FOR URBAN AFFAIRS

URBAN COALITION, NATIONAL, is an organization that works to solve urban problems in the United States. It seeks to identify the most urgent problems of urban areas, to make the nation aware of the problems, and to begin action on them.

The coalition brings together people from many backgrounds to obtain better jobs, housing, education, and health facilities for urban residents. It is financed by corporations, foundations, individuals, labor unions, and religious groups. A committee of about 90 national leaders establishes policies for the national group. The coalition has approximately 50 local groups in about 25 states and the District of Columbia.

The National Urban Coalition was formed in 1970 through the merger of the Urban Coalition and Urban America, Inc. The Urban Coalition was created in 1967 following riots in several of the nation's largest cities. It sought to improve the conditions that had bred the disorders. Urban America, Inc., was established in 1965 to gather and distribute information and to give technical assistance in housing and urban design and planning. The National Urban Coalition has headquarters at 2100 M Street NW, Washington, D.C. 20037.

Critically reviewed by the NATIONAL URBAN COALITION

URBAN LEAGUE is an organization that works to end discrimination and to gain equal opportunities for Negroes and other minority groups in the United States. It urges them to become involved in programs aimed at improving their economic and social conditions. Goals of the programs include voter education, improved police-community relations, and the establishment of black-owned businesses.

The Urban League tutors young people and gives them career guidance. It helps families find homes to rent or buy, urges employers to adopt fair hiring and promotion practices, and places minority group members in apprenticeships and job retraining programs. It also gathers and publishes facts about conditions under which Negroes live.

The NATIONAL URBAN LEAGUE was founded in 1910. It has national headquarters at 55 E. 52nd Street, New York, N.Y. 10022. There are local Urban League groups in about 100 U.S. cities. M. CARL HOLMAN

URBAN MOVEMENT. See POPULATION (Urban and Rural Population).

URBAN RENEWAL

URBAN RENEWAL refers to city programs to eliminate slums and replace them with improved residential, commercial, or industrial areas. Urban renewal programs also try to upgrade areas that show signs of becoming slums and to improve the environment generally. In the United States, cities receive financial and technical aid from the federal government to plan and carry out urban renewal programs.

How Urban Renewal Works. Some declining neighborhoods can be renewed through building-repair programs, cleanup campaigns, or enforcement of housing and health codes. Other areas may have to be destroyed completely and then rebuilt. A city buys such areas, demolishes them, and sells the cleared land for private development projects or public use. For example, the land may become the site of a new shopping and office center, a college, or a private or public housing development. The city may build a new playground, school, hospital, or some other public facility on part of the land. To acquire a large enough site, a city may have to use the power of *eminent domain*—that is, force the sale of private property for public use.

Urban renewal projects are planned and carried out by a local public agency. The agency may be a housing authority, a department of a city government, or a separate agency that handles only urban renewal problems. Federal grants pay for either two-thirds or three-fourths of the net cost of an urban renewal project, depending on the size of the city. To qualify for federal assistance, a city must adopt a community development program that is approved by the U.S. Department of Housing and Urban Development. The city must also hold public hearings before land can be purchased for urban renewal. In this way, arguments for and against a proposed urban renewal program can be brought to public attention.

Before a run-down neighborhood can be cleared, the residents and business establishments must be relocated. The city is required to provide displaced families with decent, safe, and sanitary housing at prices and rents they can afford. Financial aid is given to residents and businesses for their moving expenses and property losses. Families and elderly persons may receive government payments to help them relocate.

Achievements and Problems. Urban renewal has helped provide better housing for thousands of urban families. Parks, schools, hospitals, libraries, and museums have been built on cleared slum land. Urban renewal has also revived declining downtown areas and brought about new industrial and commercial development. This development has created large numbers of new jobs and has provided more tax money for cities. In many cities, urban renewal areas are the only areas with stable, racially integrated communities.

The most serious challenge faced by urban renewal is the relocation of families displaced by various projects. A large proportion of the displaced people have been Negroes and members of other minorities. In spite of laws outlawing discrimination in the sale and rental of housing, these families have had difficulty finding adequate homes. Many have moved into already overcrowded areas, thus helping to create new slums. Some renewal projects have displaced low-income families so

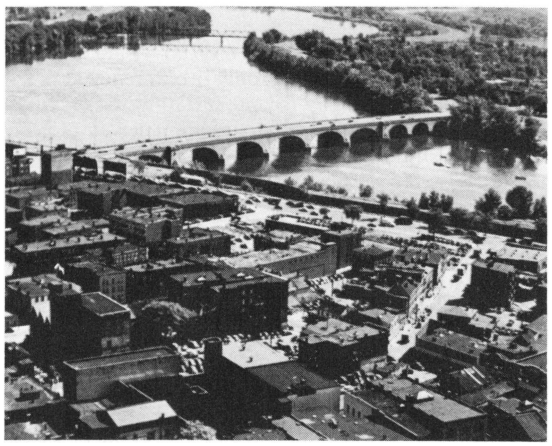
that luxury apartments and other facilities for higher-income persons could be built. Some social scientists argue that urban renewal destroys the community spirit of established neighborhoods. Others claim the benefits of urban renewal outweigh its disadvantages.

History. The federal government made its first major attempt at slum clearance in the 1930's. The United States Housing Act of 1937 set up the U.S. Housing Authority to help clear slums and provide public housing for low-income families.

In 1949, Congress passed a bill providing for large-scale slum clearance and private rebuilding of these areas. A 1954 law granted aid to cities to rehabilitate older housing. During the 1960's, the range of urban renewal activities increased in many cities. JACK MELTZER

Related Articles in WORLD BOOK include:

City (City Problems)
City Planning
Conservation (picture: Urban Renewal Projects)
Eminent Domain
Housing
Housing and Urban Development, Dept. of
Model Cities
Slum



URBANA. See CHAMPAIGN-URBANA.

URD. See NORNS.

URDU. See PAKISTAN (Cultural Groups and Languages); INDIA (Languages).

UREA, *yoo REE uh,* is an organic compound in the urine, blood, and lymph of man and other mammals. It is formed in the liver from nitrogen compounds.

Until 1828, chemists thought that only certain life processes could produce organic compounds such as urea. But then, the German chemist Friedrich Wöhler *synthesized* (made artificially) urea from a cyanate and an ammonium salt. His discovery is usually considered the birth of synthetic organic chemistry.

Urea is used in fertilizer and animal feeds, and to make other chemical compounds. The plastics industry uses it to manufacture resins for plastics. Urea is also used as a stabilizer in certain explosives.

Industry prepares urea commercially from liquid ammonia and liquid carbon dioxide. Under high pressure, these chemicals form ammonium carbamate, $NH_4CO_2NH_2$. This decomposes to give urea and water.

Urea occurs as white crystals or powder, and has a faint odor. It dissolves readily in water. Its chemical formula is NH_2CONH_2, and it melts at 132.7° C (271° F.). It is also called *carbamide.* E. CAMPAIGNE

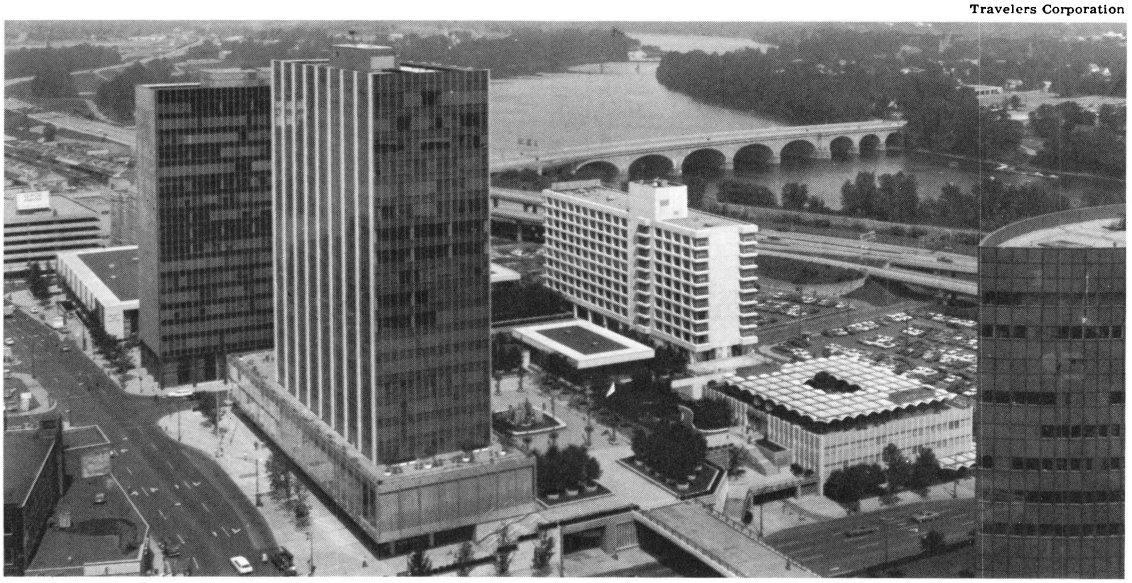
See also LIVER; SICKLE CELL ANEMIA; URINE; WÖHLER, FRIEDRICH.

UREMIA, *yu REE mee uh,* is a condition that occurs when poisonous wastes build up in the blood. Such wastes normally pass out of the body in the urine, which is produced by the kidneys. Uremia results if the kidneys do not rid the body of these wastes. The word *uremia* means *urine in the blood.*

Uremia occurs mostly in adults who have a kidney disease. Uremia develops gradually as more and more poisons accumulate because of the damaged kidneys.

Urban Renewal Projects replace old, run-down buildings with modern, functional structures. One of Connecticut's first major urban renewal projects, Constitution Plaza in Hartford, is shown before urban renewal, *left,* and after the project was completed, *below.*

Travelers Corporation



Physicians can successfully treat a few of the diseases that cause uremia. But in most cases, the diseased kidneys cannot be repaired, and advanced uremia occurs. The symptoms of advanced uremia include abdominal pain; breath that smells of urine; diarrhea; dizziness; drowsiness; headache; hiccups; itchy, yellowish-tan skin; lack of appetite; and vomiting. The patient also may have convulsions, mental disturbances, and muscular twitching. In time, he becomes unconscious, a condition called *uremic coma*. Death follows in most cases.

Physicians use two methods to keep advanced uremia victims alive. A *dialysis machine* cleanses the blood in much the same way as the kidneys do. Surgeons also perform kidney transplants to replace diseased kidneys with healthy ones. BENJAMIN T. BURTON

See also KIDNEY; NEPHRITIS; TISSUE TRANSPLANT.

URETER. See KIDNEY.

URETHRA. See BLADDER; KIDNEY.

UREY, *YOO ree,* **HAROLD CLAYTON** (1893-), an American chemist, has made important contributions in two main fields. During his early career, he conducted research on *isotopes*, which are atoms of the same element that differ in atomic weight. Urey's later work centered on the history and chemical nature of the solar system. During the late 1960's and early 1970's, he played a prominent role in the interpretation of lunar samples gathered by Apollo astronauts.

Urey won the 1934 Nobel prize for chemistry for the discovery of deuterium, a rare isotope of hydrogen (see DEUTERIUM). During World War II (1939-1945), he directed a laboratory where isotopes of boron, hydrogen, and uranium were produced for use in the development of the atomic bomb.

Jack Hamilton

Harold Urey

Urey's study of the earth and solar system began after the war. He calculated the temperature of ancient oceans by determining the amount of certain isotopes in fossil shells. He also studied the chemical composition of the sun, the moon, and the planets and formulated theories on the origin of the solar system.

Urey was born in Walkerton, Ind. He earned a bachelor's degree in zoology from the University of Montana and, in 1923, a Ph.D. in chemistry from the University of California at Berkeley. He served on the faculty of Columbia University from 1929 to 1945 and at the University of Chicago from 1945 to 1958. Urey joined the faculty of the University of California at San Diego in 1958. DANIEL J. KEVLES

URGA. See ULAN BATOR.

URINE, *YOO rin,* is a liquid waste product of the body. The kidneys take urine out of the blood. A healthy person's urine is amber-colored and slightly acid. Urine is a little heavier than water with an average specific gravity of 1.022. It is made up of water, urea, creatinine, uric acid, and inorganic salts. The inorganic salts include sodium, potassium, ammonia, calcium, and magnesium.

Blood reaches the kidneys through the *renal* arteries. Waste matter and water removed from this blood passes from the kidneys to the bladder through two small tubes, the *ureters*. The urine is expelled from the bladder to the outside through another tube, the *urethra*.

The kidneys do not always give off the same amount of urine. During sleep, the amount is smaller and more concentrated. They form less urine when a person perspires freely, and more when he drinks large amounts of liquid. The *antidiuretic hormone*, given off by the pituitary gland, controls the amount of water held by the *nephrons* (tiny kidney tubes). Certain diseases may also change the amount and strength of urine.

The condition of urine is often an index to a person's health. Sugar in the urine is a symptom of diabetes. Albumin and blood in the urine may mean the kidneys have been damaged. EWALD E. SELKURT

Related Articles in WORLD BOOK include:

Bladder	Diuretic	Urea
Diabetes	Kidney	Uremia

URIS, *YOO ris,* **LEON MARCUS** (1924-), is an American novelist. His best-known work, *Exodus* (1958), tells about Jewish immigration into Palestine and the struggle to establish the state of Israel in the 1940's. It was made into a successful motion picture. Uris also wrote *Mila 18* (1961), a story of the Jewish revolt in the Warsaw ghetto during World War II. His other works include *Battle Cry* (1953), *The Angry Hills* (1955), and *Armageddon* (1964). Uris was born in Baltimore.

UROLOGY. See MEDICINE (table: Major Medical Specialty Fields).

URQUIZA, JUSTO JOSÉ DE. See ARGENTINA (The 1853 Constitution).

URSA MAJOR AND URSA MINOR. See BIG AND LITTLE DIPPERS.

URSINUS COLLEGE. See UNIVERSITIES AND COLLEGES (table).

URSULA, *UR suh luh,* **SAINT,** is a saint of the Roman Catholic Church. According to legend, Ursula was a maiden from Britain, who was martyred, together with 11,000 maiden companions. Returning from a pious pilgrimage to Rome, they were attacked by Huns at Cologne, and killed for their faith. Saint Ursula's feast day is October 21. See also URSULINES. FULTON J. SHEEN

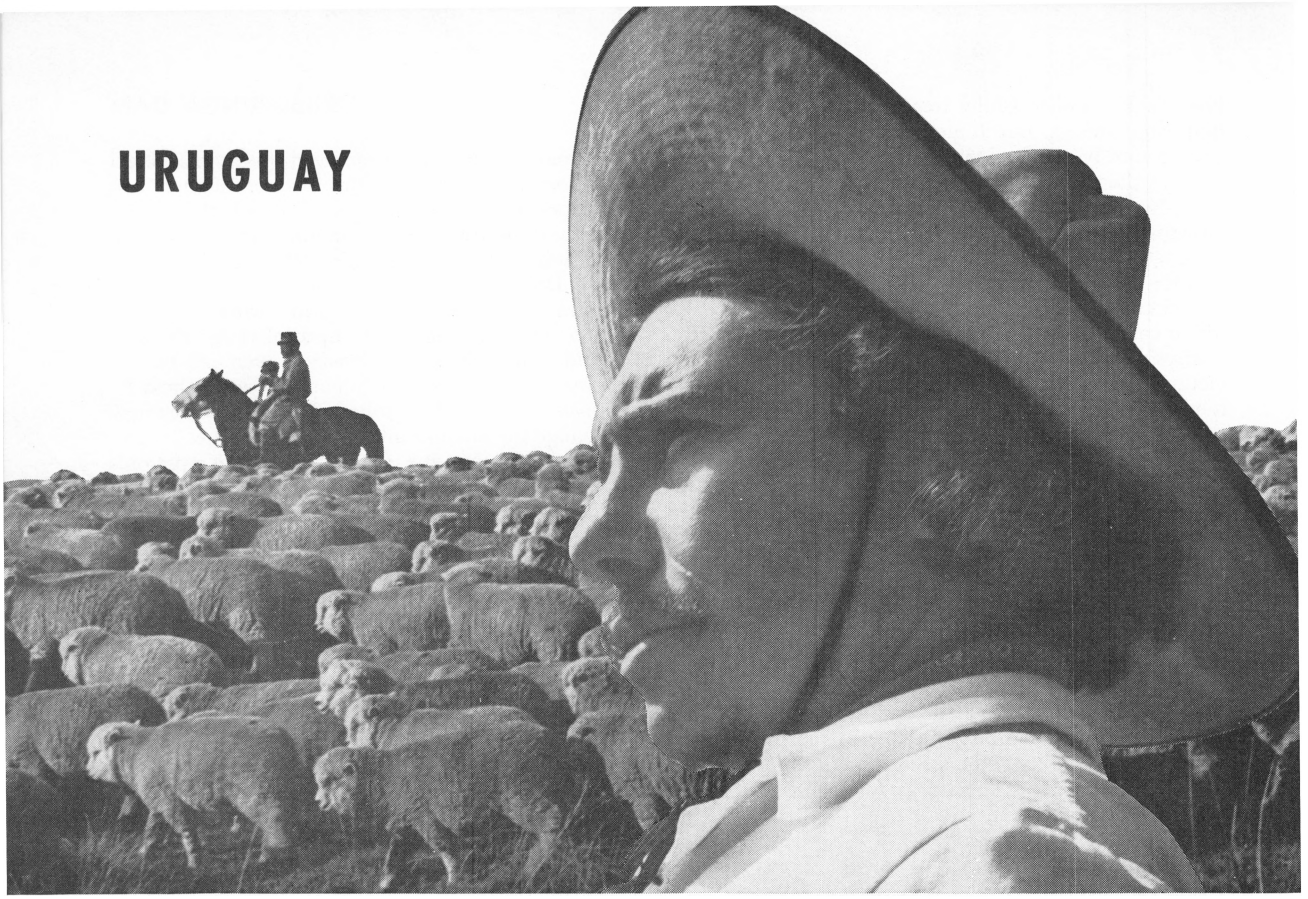
URSULINE COLLEGE. See UNIVERSITIES AND COLLEGES (table).

URSULINES, *UR suh lihnz,* are members of a Roman Catholic order of women. The order was named for Saint Ursula, its patron saint. The order, also called the *Nuns of Saint Ursula*, was established at Brescia, Italy, in 1535, by Saint Angela Merici. The primary work of the Ursulines is the teaching of girls and young women. From the first, the community observed strict discipline. It became a cloistered order through the aid of Saint Charles Borromeo. In 1574 the Ursuline nuns entered France, and a convent was built for them near Paris in 1611. The order spread rapidly to most countries of Europe and to America. Convents were established in Quebec in 1639 and in New Orleans in 1727. The number of Ursuline nuns in all countries totals about 4,500. See also URSULA, SAINT. FULTON J. SHEEN

URTICARIA. See HIVES.

URUBUPUNGÁ DAM. See BRAZIL (Natural Resources).

URUGUAY



Pan American World Airways; Screen Traveler, Gendreau

The Gauchos Are the Cowboys and Sheepherders Who Developed Uruguay's Rich Livestock Industry.

URUGUAY, *YOO ruh gwy,* is the smallest republic in South America. A land of low hills and green pasturelands, it lies on the southeast coast of South America. It is smaller than Kansas, but it has about 800,000 more people than that state. Nearly half the people raise sheep and cattle. The country has one of the highest living standards in South America.

From 1951 to 1967, Uruguay had one of the most unusual democratic governments in the world. A nine-man national council headed the government, instead of a president or prime minister. But the constitution adopted in 1967 provided for a government headed by a president.

Before 1828, people in the Spanish colony of Buenos Aires, Argentina, called Uruguay the *Banda Oriental* (East Bank), because it lay east across the Río de la Plata (Silver River). Uruguay became independent in 1828. Its name in Spanish, the official language, is La República Oriental del Uruguay (The Eastern Republic of Uruguay). Montevideo is the capital.

The Land and Its Resources

Uruguay is separated from Argentina on the south and west by the Río de la Plata and the Uruguay River. It has three land regions: (1) the coastal lowlands, (2) the highlands, and (3) the pasturelands.

The Coastal Lowlands form a narrow belt of sand dunes like those of North and South Carolina. This region stretches along Uruguay's Atlantic coast and along the Río de la Plata.

The Highlands. The land rises gradually from the eastern coast to highlands that extend from the Brazilian border almost to the southern coast. Uruguayans call these highlands *Cuchilla Grande* (Big Knife), because knifelike formations of granite jut through the surface

FACTS IN BRIEF

Capital: Montevideo.

Official Language: Spanish.

Form of Government: Republic. *Head of Government*—President.

Area: 68,536 sq. mi. (177,508 km²). *Greatest Distances*—north-south, about 330 mi. (531 km); east-west, about 280 mi. (451 km). *Coastline*—about 600 mi. (966 km).

Population: *Estimated 1976 Population*—3,100,000; distribution, 81 per cent urban, 19 per cent rural; density, 44 persons per sq. mi. (17 per km²). *1963 Census*—2,595,510. *Estimated 1981 Population*—3,291,000.

Chief Products: *Agriculture*—linseed, meat, wheat, wool. *Manufacturing and Processing*—canned meat, glass, leather, linseed oil, textiles. *Mining*—granite, gravel, limestone, marble, sand.

National Anthem: "Himno Nacional del Uruguay" ("National Hymn of Uruguay").

Flag: A gold sun on a white canton appears on a field of nine white and blue horizontal stripes. The stripes represent Uruguay's original nine political subdivisions. See Flag (picture: Flags of the Americas).

National Holiday: Independence Day, August 25.

Money: *Basic Unit*—peso. For the value of the peso in dollars, see Money (table: Values). See also Peso.

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San Ramón	5,672 C 3
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Santiago Vázquez	C 2
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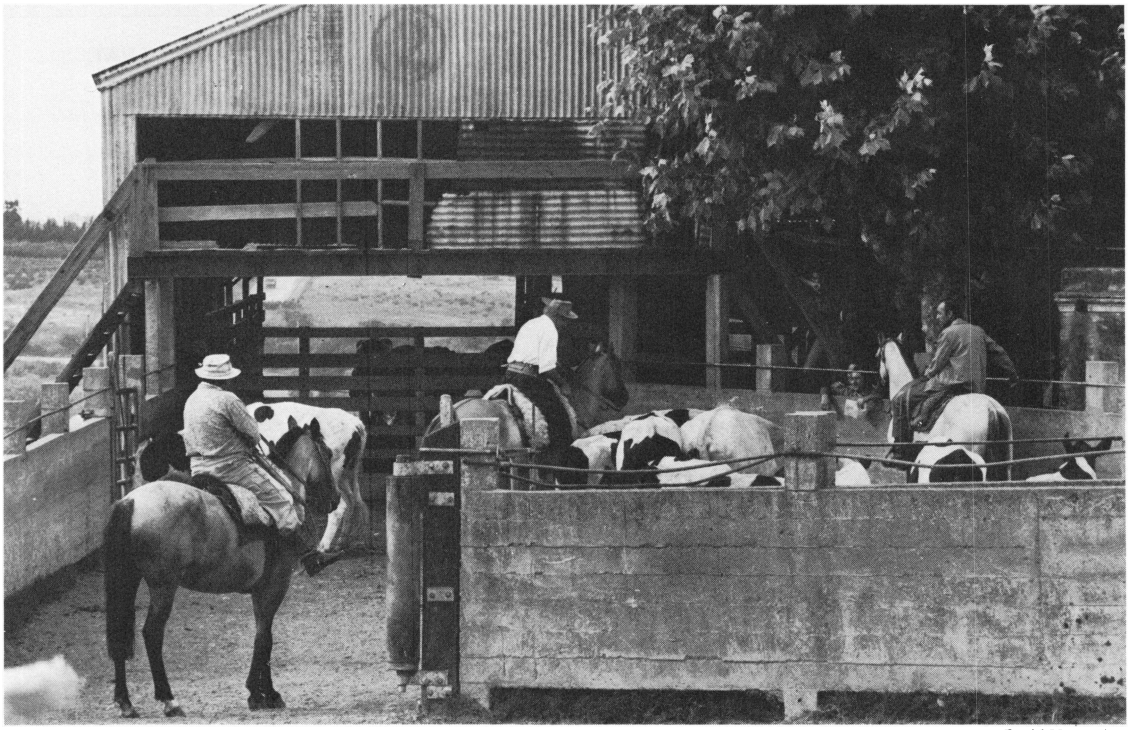
Sarandí Grande	5,295 B 2
Sauce	3,227 C 2
Solís	C 3
Suárez	3,052 C 2
Tacuarembó	29,011 A 3
Tala	3,213 C 3
Tranqueras	3,658 A 3
Treinta y Tres	21,035 B 3
Trinidad	15,455 B 2
Vázquez	A 3
Young	7,974 B 2

Source: Census figures.

*Not on map; key shows general location.

Physical Features

Arapey Grande R.	A 2
Cabo Santa María (Cape)	C 3
Cebollatí R.	B 3
Cuchilla de Belén (Mts.)	A 2
Cuchilla de Haedo (Mts.)	B 2
Cuchilla Grande (Mts.)	B 3
Daymán R.	A 2
Embalse del Río Negro (Reservoir)	B 3
Lagoa Mirim (Lake)	B 4
Laguna de Castillos (Lake)	C 4
Mirador Nacional (Mtn.)	C 3
Negro R.	B 2
Punta Aguda (Pt.)	C 4
Queguay Grande R.	B 2
Río de la Plata (Estuary)	C 2
Santa Lucía R.	C 3
Tacuarembó R.	A 3
Uruguay R.	B 1
Yaguarón R.	B 4
Yí R.	B 2



David Mangurian

Cattlemen Sell Their Livestock at an auction yard near Montevideo, *above*. The city, which has a large meat packing industry, ships beef and cowhides to many parts of the world.

David Mangurian

Punta del Este, *above,* one of Uruguay's most fashionable resort spots, has fine beaches, hotels, and nightclubs. The seaside city lies about 70 miles (113 kilometers) east of Montevideo.

soil on many of the ridges. The highest point in Uruguay is 1,644-foot (501-meter) Mirador Nacional in the Cuchilla Grande. Highlands also run along parts of the northern border.

The Pasturelands begin at the highlands in eastern Uruguay and spread across the country to the Uruguay River. They cover about four-fifths of the country.

Uruguay Covers an Area Smaller than Kansas.

WORLD BOOK map

Location of Uruguay

Rivers. The major rivers are the Uruguay and the Negro. The Río de la Plata is really the bay formed by the Paraná and Uruguay rivers.

Natural Resources. Uruguay's vast pasturelands are its most valuable resource. Pastures, often with grass 3 feet (91 centimeters) high, support the sheep and cattle industries. Uruguay has no important forests. Its few minerals include limestone, granite, and marble.

Climate. Uruguay's climate is generally mild. July (winter) temperatures average from 50° to 55° F. (10° to 13° C). January (summer) temperatures average from 70° to 75° F. (21° to 24° C). Rainfall averages only about 45 inches (114 centimeters) a year, and it is spread throughout the year. Droughts sometimes occur.

Life of the People

About 19 of every 100 persons in Uruguay live in *rural* (farm) areas. About 81 of every 100 live in *urban* (city) areas. Montevideo has about 50 per cent of the urban population.

Most of the people speak Spanish and have Spanish or Italian ancestry. Early European settlers drove out nearly all the Charrua Indians, the original inhabitants. Indians make up less than one-tenth of the population today. Most of them live in farm areas.

Uruguay has complete religious freedom. About two-thirds of the people are Roman Catholics. The rest belong mostly to the Anglican and Methodist churches.

Way of Life. The father of a typical family in Uruguay works on a ranch, in a meat-packing plant, or in a wool warehouse. The mother cares for the home.

Shelter. Most people in the cities live in small, tile-roofed houses made of stucco, brick, or concrete, although some live in modern apartment buildings. The houses and apartment buildings often resemble those in Florida and southern California. The government of

Ernst A. Jahn, DPI

Montevideo's Harbor, *above,* is an inlet of the Río de la Plata. The port, which serves ships from many parts of the world, helps make Montevideo the transportation center of Uruguay.

Uruguay has built numerous low-rent housing developments.

Most ranch owners live in one-story brick houses, plastered on the outside and roofed with tile. Ranch workers and their families usually live near the ranch owner in one- or two-room thatch-roofed houses made of stone, brick, or *adobe* (sun-dried clay brick).

Food. The people eat much meat, particularly beef. Popular dishes include *pavesa* (a type of beef broth) and *asado con cuero* (beef barbecued in its hide). *Yerba maté*, a South American tea, is a favorite drink.

Clothing. Most Uruguayans wear clothing similar to that worn in the United States and Canada. Men on the ranches sometimes wear the boots, loose trousers, neckerchiefs, and broad-brimmed hats worn by the gauchos more than 100 years ago.

Recreation. Uruguayan soccer teams have won several Olympic championships. Other popular sports include polo, swimming, boating, golf, and tennis.

Uruguayans celebrate their most colorful festival, the *carnaval*, during the three days before Lent. They sing, dance, and parade in masks and colorful costumes.

City Life. Montevideo is the only city in Uruguay with more than 100,000 people. The cities are clean and modern, with tall buildings, broad streets, beautiful parks and homes, good sewerage systems, and electricity. For details on the major cities, see MONTEVIDEO; PAYSANDÚ; SALTO.

Ernst A. Jahn, DPI

The Palacio Salvo, a landmark of Montevideo, faces the Plaza Independencia, *foreground,* in the heart of the business district. Many people view the city from the top of this 27-story building.

Country Life centers around farms, ranches, and small villages. Cattle herded by roving bands of gauchos once roamed over open plains. As the herds increased, cattle owners built fences to keep them separate. This was the beginning of the modern *estancias* (ranches). Gauchos still herd cattle on the larger ranches, which sometimes cover more than 12,000 acres (4,860 hectares). Small villages usually consist of one or two stores and a cluster of brick or adobe houses.

Work of the People

About half of Uruguay's people work in agriculture. Ten persons of every 100 make their living in commerce, manufacturing, or government. The rest work in such fields as construction and mining. The average income, about $560 a year, is exceeded in South America only in Venezuela and Argentina. The government owns all the railroads, power plants, and telephone and telegraph services in the country. Government plants and businesses compete with private companies in many industries.

Agriculture, particularly sheep and cattle raising, is the chief industry. Sheep and cattle graze on the vast pasturelands throughout the year, because of the mild, even climate. Farmers cultivate less than one-tenth of the farmland. Most of them live in the south, where their goods can be transported easily to markets in Montevideo. They grow wheat on about half the farmland, and also raise alfalfa, barley, citrus fruits, corn, and oats. Uruguay is a leading flaxseed producer.

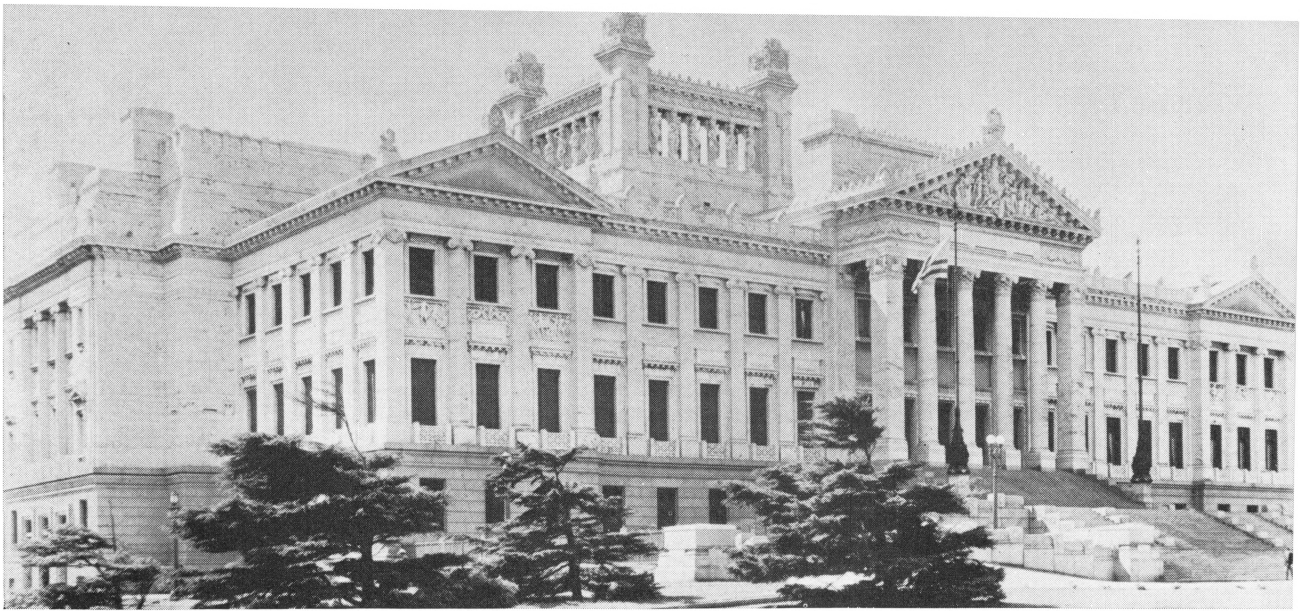
The government helps the farmers by paying them subsidies for such items as wheat, dairy products, and cattle. The government often pays part of the cost of shipping cattle to meat-packing plants. Since 1948, the government has bought many large ranches and sold them in smaller parcels to farmers.

Manufacturing. Meat packing and tanning are the main manufacturing industries. Other Uruguayan industries produce beverages, clothing, foods, furniture, glassware, leather goods, linseed oil, and tobacco products.

Electric Power plants provide as much power as is needed by Uruguay's farms and factories. A hydroelectric plant on the Negro River at Rincón del Bonete produces more than half the nation's power.

Trade. Uruguay imports more goods than it exports. Wool and meat account for more than half the exports. Wool shipments sometimes total 90,000 short tons (82,000 metric tons) a year and rank among the world's largest. Hides make up about 14 per cent of the exports. Uruguay imports raw materials and such goods as automobiles, cotton, iron and steel, and machinery. It trades mostly with the United States and Western European countries. It joined the Latin American Free Trade Association in February, 1960.

Transportation is centered in Montevideo. Roads, railroads, and airlines connect the main cities. The country has about 1,900 miles (3,060 kilometers) of railroad tracks and more than 25,000 miles (40,200 kilometers) of roads and highways. Uruguay's section of the Pan American Highway runs from Rio Branco to Colonia.



Dana Brown, F. P. G.

The Legislative Building Is One of Many Government Structures in Montevideo.

Communication. Montevideo has 15 of the nation's 25 newspapers, and several magazine- and book-publishing firms. Television stations in Montevideo, and radio stations throughout the country, entertain and inform the people. Many cities have telegraph, radio-telegraph, and radio-telephone service.

Education

About 90 of every 100 Uruguayans can read and write. The law requires all children to attend elementary school, starting at the age of 6. The government operates free schools from kindergarten through college.

The University of the Republic in Montevideo was founded in 1849. Students from any country may attend this university without charge. The Technical University consists of 74 different technical schools located throughout the country. Students in these schools learn such subjects as architecture, engineering, and agriculture. There are also several teachers colleges, and schools for the blind and handicapped students.

The Arts

Juan Manuel Blanes (1830-1901), the first important Uruguayan painter, gained fame for his paintings that illustrated the nation's history. The paintings of Pedro Fígaro (1861-1938) achieved international fame. The most prominent artists in Uruguay today include the painter José Cúneo (1887-) and the sculptor José L. Zorrilla de San Martín (1891-).

Horacio Quiroga (1879-1937) was one of the earliest Uruguayan writers and poets. Alberto Zum Felde (1889-), a writer and critic, is an outstanding literary figure in Uruguay today.

One of Uruguay's best-known musicians is Héctor Tosar Errecart (1923-), a pianist and composer who has won world recognition. Much Uruguayan folk music comes from the legends of the gauchos.

What to See and Do in Uruguay

Beaches and resorts at such places as Montevideo, Balneario Carrasco, and Punta del Este make the country a favorite vacation spot. People flock to Solís, Santiago Vázquez, Vázquez, Atlántida, and many other river and coastal cities to enjoy fishing and boating.

Uruguayans call Montevideo the *City of Roses*, because of the thousands of roses in its gardens and parks. Museums, theaters, and libraries have made the capital a main cultural center of South America.

Government

Under the constitution adopted in 1967, the people elect a president to head the government of Uruguay. He serves a five-year term and may not be re-elected until five years after leaving office. The president appoints the Council of Ministers (Cabinet), who head various government departments.

The 1967 constitution also provides for a two-house legislature called the General Assembly. But in 1973, military leaders forced President Juan M. Bordaberry to dissolve the General Assembly, as well as the nation's local government councils. A National Security Council was created to manage the government. The council consists of representatives of the armed forces and certain cabinet ministers. President Bordaberry and the National Security Council rule by decree. A 25-member Council of State, appointed by the president, reviews government decrees to determine their constitutionality.

Courts. The supreme court controls all the courts. A chief justice and four associate justices are appointed to 10-year terms. They may not be re-appointed until after five years following their term. The supreme court appoints judges in the lower courts and all justices of the peace. Uruguay's laws come from the constitution and from laws passed by the federal government and local governments.

Taxation. The government operates many businesses that sell to people at low prices. It must levy many taxes to run these businesses. The people pay a general income tax, and taxes on such things as motion-picture admissions, matches, rentals, and gasoline.

Politics. All citizens 18 or older may vote in Uruguayan elections. The country's two major political

parties are the Colorados and the Blancos. In general, the Colorados believe the government should manage many industries and should break up large estates into small farms. The Blancos represent the landowners who oppose such policies. Since the closing of Uruguay's legislature in 1973, political parties have no longer been active in the government.

Armed Forces. A total of about 21,000 men serve in Uruguay's army, navy, and air force. In addition, the country has about 100,000 men in its military reserve units. Service in the armed forces is voluntary.

History

Early Years. In 1516, the Spanish navigator Juan Díaz de Solís (1470-1516) became the first white man to land in Uruguay. But when Solís and part of his crew went ashore, fierce Charrua Indians killed them.

In 1680, the Portuguese established the first white settlement in Uruguay. They built a fort at Colonia, across the Río de la Plata from Buenos Aires, Argentina. Spain wanted to check Portuguese expansion in Uruguay, so Spanish colonists founded Montevideo in 1726. By the 1770's, the Spaniards had settled most of Uruguay. They attacked Colonia in 1777, and drove the last of the Portuguese out of the country.

In 1810, José Gervasio Artigas organized an army to fight for independence from Spain. Artigas had served with the Spanish cavalry. He had almost defeated the Spanish by 1817, when Portuguese troops from Brazil attacked both the Spanish and the Uruguayans and captured Montevideo. In 1820, the Portuguese annexed Uruguay to Brazil and drove Artigas into exile. Artigas never returned to Uruguay. But a group of his followers, called "The Immortal Thirty-three," revolted against Brazil in 1825. Their armies held most of Uruguay within a few months. Uruguay then decided to unite with Argentina for protection against Brazil.

Independence. In 1825, Argentina joined Uruguay in the war against Brazil. Great Britain intervened in 1826 because a Brazilian blockade of Montevideo and Buenos Aires interfered with British trade. In 1828, because of the British intervention, Brazil and Argentina recognized Uruguay as an independent republic. Uruguay adopted its first constitution in 1830.

Civil War. In 1830, the revolutionary leader Fructuoso Rivera (1790-1854) was elected the first president of Uruguay. After his term ended in 1836, he tried to regain power by leading a revolt against his successor, Manuel Oribe (1800-1857). In this civil war, Oribe's forces called themselves *Blancos* (Whites), and Rivera's men called themselves *Colorados* (Reds). The Colorados won in 1852 after 16 years of fighting the Blancos.

Struggles for Power. Uprisings and rebellions continued, as control of the government changed from one party to another. The Colorados won in 1865, and held power until 1958. But revolutions upset the nation until the 1900's. From 1865 to 1870, Uruguay fought a war with Paraguay. See PARAGUAY (History).

Reforms in the Early 1900's. José Batlle y Ordóñez (1856-1929) was elected president in 1903. He soon put the government in control of the banks, improved the labor laws, and gave credit and aid to farmers. He also encouraged the construction of new harbors, factories, homes, and public buildings.

Leon Kofod

The Spanish Pioneers who settled in Uruguay during the 1700's and 1800's are honored by a life-sized bronze monument called *La Carreta* (The Cart). The monument stands in a park in Montevideo.

Batlle thought the great powers of the presidency had caused the country's many revolutions. He worked for a new constitution, which was adopted in 1917. It established a national council. President Gabriel Terra (1873-1942) dissolved the council in 1933.

Recent Events. In 1942, Uruguay severed relations with the Axis powers. Uruguay declared war on Germany and Japan in 1945, but no Uruguayan troops went into battle. The country became a charter member of the United Nations that same year.

In 1951, a new constitution dissolved the presidency and replaced it with a nine-man national council as head of the government. The council was set up to ensure that both the Blanco and Colorado political parties would share in the government. But it was inefficient and too slow in acting on economic problems. Foreign trade declined, and government spending increased to provide welfare benefits demanded by the people. In 1967, Uruguay adopted a new constitution and returned to the presidential system of government.

In 1961, the Organization of American States met at Punta del Este to sign the charter for the Alliance for Progress, a Latin-American aid program. It met again at Punta del Este in 1962 to suspend Cuba from participation in OAS affairs because of that country's Communist revolutionary activities in Latin America. In 1964, Uruguay joined other OAS nations in breaking relations with Cuba because of Cuban interference in Venezuela. In 1967, the presidents of the American nations met at Punta del Este to approve the formation of a Latin-American common market.

General Oscar Daniel Gestido, a member of the Colorado Party, was elected president in 1967. He died in December of that year and was succeeded by the vice-president, Jorge Pacheco Areco. In 1971, agriculture minister Juan M. Bordaberry of the Colorado Party was elected president.

During the mid-1900's, inflation, unemployment, and other economic problems caused unrest in Uruguay. At the same time, antigovernment terrorist groups became active. One group, the Tupamaros, carried out kidnapings and murders of Uruguayan and foreign officials.

In June, 1973, military leaders forced President Bordaberry to dissolve Uruguay's national legislature and local government councils. The government then began to rule by decree. Although President Bordaberry remained in office, the military leaders dominated the government. President Bordaberry said his actions were necessary to deal with Uruguay's economic and political problems. JOHN TATE LANNING

Related Articles in WORLD BOOK include:

Agate	Paysandú
Artigas, José Gervasio	Rodó, José Enrique
Batlle y Ordóñez, José	Río de la Plata
Gaucho	Salto
Montevideo	Uruguay River

Outline

I. The Land and Its Resources
II. Life of the People
III. Work of the People
IV. Education
V. The Arts
VI. What to See and Do in Uruguay
VII. Government
VIII. History

Questions

What is Uruguay's most valuable natural resource?
What export ranks among the largest in the world?
Who were the first white men to settle in Uruguay?
Why is José Artigas important in Uruguay's history?
How does Uruguay rank in size among South American republics?
How much must a student from another country pay to attend the University of the Republic?

URUGUAY RIVER is part of the great Paraná and La Plata river system of South America. The Uruguay rises in the state of Santa Catarina in southern Brazil and flows west, and then south for about 1,000 miles (1,600 kilometers). It empties into the bay of the Río de la Plata. The Uruguay forms part of the boundary between Brazil and Argentina, and all the boundary between Uruguay and Argentina. Before it joins the Río de la Plata, the river becomes a lake from 4 to 7 miles (6 to 11 kilometers) wide. For location, see URUGUAY (map); BRAZIL (map). MARGUERITE UTTLEY

U.S. See UNITED STATES.

USEFUL ARTS give added beauty to practical items. See the following articles:

Bookbinding	Hobby	Pottery
Ceramics	Industrial Design	Printing
Engraving	Mechanical Drawing	Sewing
Handicraft	Photography	Wood Carving

USIA. See UNITED STATES INFORMATION AGENCY.

USMAN ALI, SIR. See HYDERABAD, NIZAM OF.

USO. See UNITED SERVICE ORGANIZATIONS.

USPALLATA PASS. See ANDES MOUNTAINS (Transportation).

U.S.S.R. stands for Union of Soviet Socialist Republics, the official name of Russia. See RUSSIA.

USURY, *YOO zhoo rih,* is interest at a higher rate than the law allows. The person who charges more than the maximum legal rate is a *usurer.*

In Biblical times, all payments for the use of money were regarded as usury, and were forbidden. Any money lender was then called a usurer. Romans forbade interest charges during the period of the Roman Republic, but permitted them during the time of the Roman Empire. In general, people regarded interest and usury as synonymous until the late Middle Ages, because most of the borrowers were poor persons who needed money in order to obtain the necessities of life.

But the development of modern business, which required the use of large amounts of borrowed funds, made it clear that the borrower used the funds in productive operations, and should expect to pay for their use. In time, interest came to be recognized as legitimate.

A difficulty arose because the risks and costs of making small loans were so great that legitimate dealers would not handle such loans. This gave the illegitimate "loan shark" his opportunity. Eventually people recognized that the government should permit much higher rates on small loans. The result was a uniform small-loan law, adopted by many states. It permits licensed lenders to charge as high as $3\frac{1}{2}$ per cent interest per month on an unpaid balance. The interest usually varies with the amount of money borrowed. Service charges and discounts may make the real interest rate much higher than the rate advertised. The 1968 "truth in lending" act, effective July 1, 1969, says that, in most cases, charges must be stated in dollars and in terms of true annual interest. For the legal interest rate, see INTEREST; LOAN COMPANY. JOHN ALAN APPLEMAN

Valley West by Harrison T. Groutage for the Field Enterprises Educational Corporation Collection

The Wasatch Range in Northern Utah

UTAH

The Beehive State

UTAH is an important mining state in the Rocky Mountain region. It also serves as a vital link in the transportation and communications systems of the western United States. Salt Lake City, Utah's capital and largest city, is an industrial and banking center. The city is the headquarters of the Church of Jesus Christ of Latter-day Saints. The members of this church are called *Mormons*. Mormons make up more than 60 per cent of Utah's population.

Utah has rich mineral deposits. Nearly a fifth of the nation's copper comes from Bingham Canyon near Salt Lake City. Utah ranks second only to Arizona in the production of copper, and third behind South Dakota and Nevada in gold production. It stands among the leading states in lead and uranium ore production. Utah is also among the leading producers of molybdenum, potassium salts, silver, and zinc. It is the only state that produces gilsonite, a solid form of asphalt.

The annual value of Utah's manufacturing is greater than that of its mining and farming combined. But Utah's manufacturing plants depend on the products that are mined and farmed in the state. The smelting and refining of *nonferrous metals* (metals containing no iron), and also the processing of iron and steel are important industries. Also important in the state's economy is the processing of such farm products as fruits, grain, meat, poultry, sugar beets, and vegetables.

Utah has snow-covered mountains and beautifully

colored canyons. The wind and rain have formed rocks into many arches and natural bridges. Great Salt Lake is the largest natural lake west of the Mississippi River. People can easily float in this lake because it is from four to five times as salty as the ocean. Deserts cover much of Utah, but man-made reservoirs provide irrigation water for farmland. The largest reservoirs are Lake Powell, created by Arizona's Glen Canyon Dam, and Flaming Gorge, behind Flaming Gorge Dam. Utah's chief farm products include dairy and livestock products.

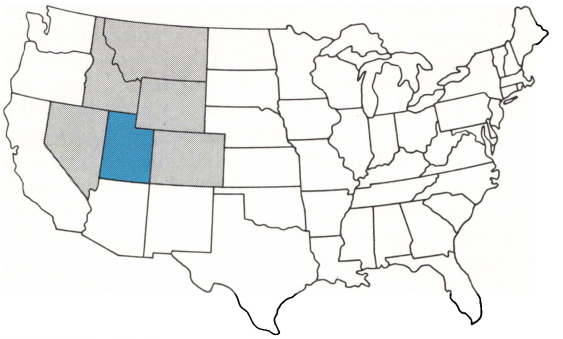
Mormon pioneers led by Brigham Young settled the Utah region in 1847. They called the region *Deseret*. This Mormon word means *honeybee*, and it stands for hard work and industry. Utah's nickname is the *Beehive State*. Congress organized the region as a territory in 1850, and named it *Utah* for the Ute Indian tribe that lived there. The early white settlers fought several battles against these Indians. In 1861, the first transcontinental telegraph message was sent across wires that met in Salt Lake City. The first transcontinental railroad system was completed at Promontory in 1869. Utah was admitted to the Union on Jan. 4, 1896.

For the relationship of Utah to other states in its region, see ROCKY MOUNTAIN STATES.

The contributors of this article are Everett L. Cooley, Professor of History, Curator of Special Collections, and Archivist at the University of Utah; Robert Layton, Chairman of the Department of Geography at Brigham Young University; and William B. Smart, Editor and General Manager of The Deseret News.

Utah Travel Council

Statue of Brigham Young in Salt Lake City



Utah (blue) ranks 11th in size among all the states, and 5th in size among the Rocky Mountain States (gray).

FACTS IN BRIEF

Capital: Salt Lake City.

Government: *Congress*—U.S. senators, 2; U.S. representatives, 2. *Electoral Votes*—4. *State Legislature*—senators, 29; representatives, 75. *Counties*—29.

Area: 84,916 sq. mi. (219,931 km²), including 2,820 sq. mi. (7,304 km²) of inland water; 11th in size among the states. *Greatest Distances*—north-south, 345 mi. (555 km); east-west, 275 mi. (443 km).

Elevation: *Highest*—Kings Peak, 13,528 ft. (4,123 m) above sea level. *Lowest*—Beaverdam Creek, in Washington County, 2,000 ft. (610 m) above sea level.

Population: *Estimated 1975 Population*—1,146,000; 36th among the states; distribution, 80 per cent urban, 20 per cent rural; density, 13 persons per sq. mi. (5 persons per km²). *1970 Census*—1,059,273.

Chief Products: *Agriculture*—barley, beef cattle, eggs, greenhouse and nursery products, hay, hogs, milk, sheep, sugar beets, turkeys, wheat. *Manufacturing*—electrical equipment, food products, nonelectrical machinery, metal products, petroleum and coal products, primary metals, printing and publishing, transportation equipment. *Mining*—coal, copper, gold, iron ore, lead, molybdenum, petroleum, sand and gravel.

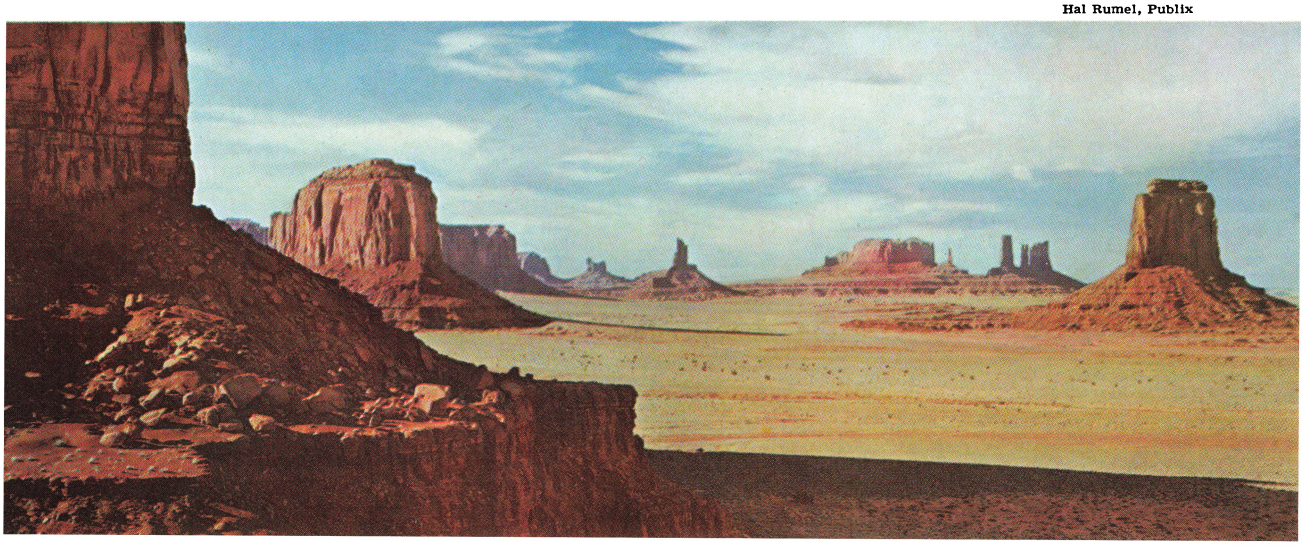
Statehood: Jan. 4, 1896, the 45th state.

State Motto: *Industry*.

State Song: "Utah, We Love Thee." Words and music by Evan Stephens.

Scenic Monument Valley, a Navajo Indian Tribal Park in Southeastern Utah

Hal Rumel, Publix



Constitution. Utah adopted its constitution in 1895, the year before it became a state. Constitutional *amendments* (changes) may be proposed by the state legislature or by a constitutional convention. An amendment proposed by the legislature must receive the approval of two-thirds of the members of each house. The amendment must then be approved in a general election by a majority of the persons voting on the issue. Before a constitutional convention can meet, it must be approved by two-thirds of the members of each house of the legislature. The convention must then be approved by a majority of the voters in a general election. Amendments proposed by a constitutional convention must receive a majority of the votes cast in a general election.

Executive. The governor of Utah serves a four-year term. He may be re-elected any number of times. He receives a yearly salary of $33,000. For a list of all the governors of Utah, see the *History* section of this article.

Other elected state officials include the attorney general, secretary of state, state auditor, and state treasurer. All serve four-year terms and may be re-elected. But the state auditor and state treasurer cannot serve two terms in a row. The secretary of state takes over as governor if the governorship becomes vacant. The governor appoints various state officials who are not elected. For example, he appoints the director of finance and the director of social services. He also appoints members of state division boards who name certain state department heads. Most of the governor's appointments must be approved by the state senate.

Legislature of Utah consists of a 29-member senate and a 75-member house of representatives. Members of both legislative houses are elected from districts drawn up according to population. The districts for both houses were redrawn in 1972 to give fair representation to all persons in the state. With the new districts, voting power was increased in cities and other urban areas, and reduced in rural areas. State senators serve four-year terms, and state representatives serve for two years. The legislature meets annually on the second Monday in January. General sessions are held in odd-numbered years. Budget sessions, to consider money matters, are held in even-numbered years. General sessions are limited to 60 days and budget sessions last 20 days. The governor may call special sessions that last up to 30 days.

Courts. Utah's highest court is the state supreme court. This court has five justices, elected to 10-year terms. The justice with the shortest remaining period in office serves as chief justice.

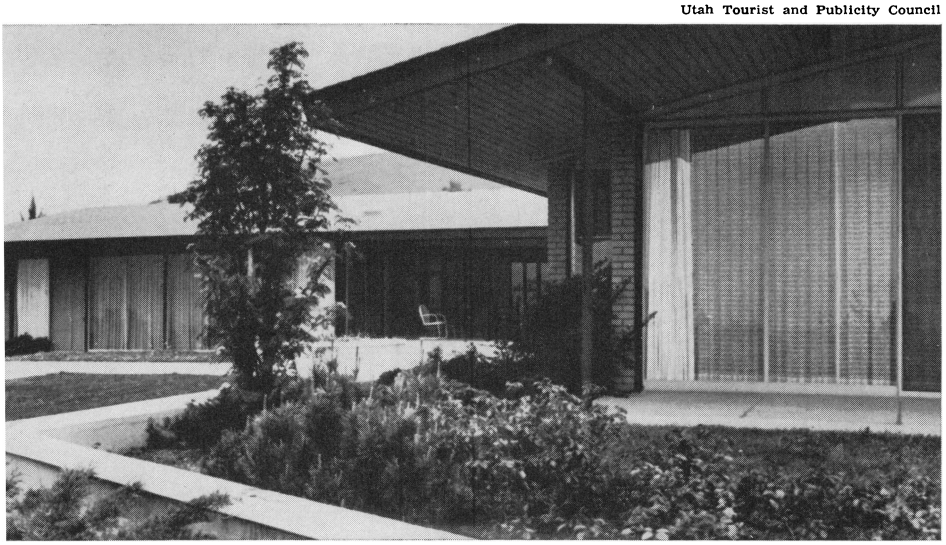
Utah is divided into seven judicial districts. Each district has one or more district court judges, depending on population. District court judges are elected to six-year terms. Other Utah courts include municipal, juvenile, and justice of the peace courts. Municipal judges are elected to six-year terms. Town trustees appoint town justices, who also are municipal judges, to six-year terms. The governor, with the advice of a juvenile court commission, appoints juvenile court judges to six-year terms. Justices of the peace are elected to four-year terms.

Local Government. Each of Utah's 29 counties is managed by a three-member board of county commissioners. Two of the members of each board are elected to four-year terms. The third member is elected for two years. The board is responsible for county affairs and for supervising county departments and officers. All other county officers are elected to four-year terms. They include an assessor, attorney, auditor, clerk, recorder, sheriff, surveyor, and treasurer.

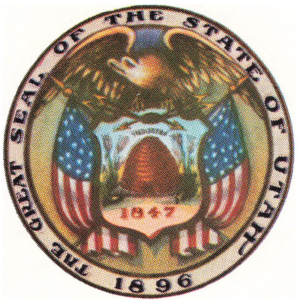
Municipalities in Utah are divided into four classes. First-class cities have 90,000 or more persons. Second-class cities have between 30,000 and 89,999 persons. Third-class cities have from 800 to 29,999 persons. Towns have fewer than 800 persons.

Any city or town may use the council-manager form

Utah Tourist and Publicity Council



Governor's Residence was completed in 1959. It stands about 3 miles (5 kilometers) east of the Capitol in Salt Lake City.



The State Seal

Symbols of Utah. On the state seal, the beehive on the shield represents industry. The sego lilies surrounding the beehive symbolize the time when Mormon pioneers ate lily bulbs to avoid starvation. "Industry" is the state motto, and 1847 was the year the Mormons came to Utah. The seal was adopted in 1896 and appears on the state flag. The flag was adopted in 1913.

Flag and bird illustrations, courtesy of Eli Lilly and Company

The State Flag

of government. First- and second-class cities may have the commissioner form. Third-class cities may use the mayor-council form. Towns may be governed by a town board of trustees. The state constitution gives municipalities the right to adopt their own charters. This right is called *home rule*, but few Utah municipalities have used it.

Taxation. Sales taxes account for nearly 40 per cent of the state government's income. Other important sources of income include individual income taxes, corporate income taxes, licenses, and property taxes. About 30 per cent of the state government's income comes from federal grants and other U.S. government programs.

Politics. Political strength in Utah has been fairly evenly divided between the Democratic and Republican parties. Republicans gained strength between the late 1940's and early 1960's. Democrats won most state offices in the 1964 election, but Republicans won most of the offices in 1966 and 1968. For Utah's electoral votes and voting record in presidential elections, see ELECTORAL COLLEGE (table).

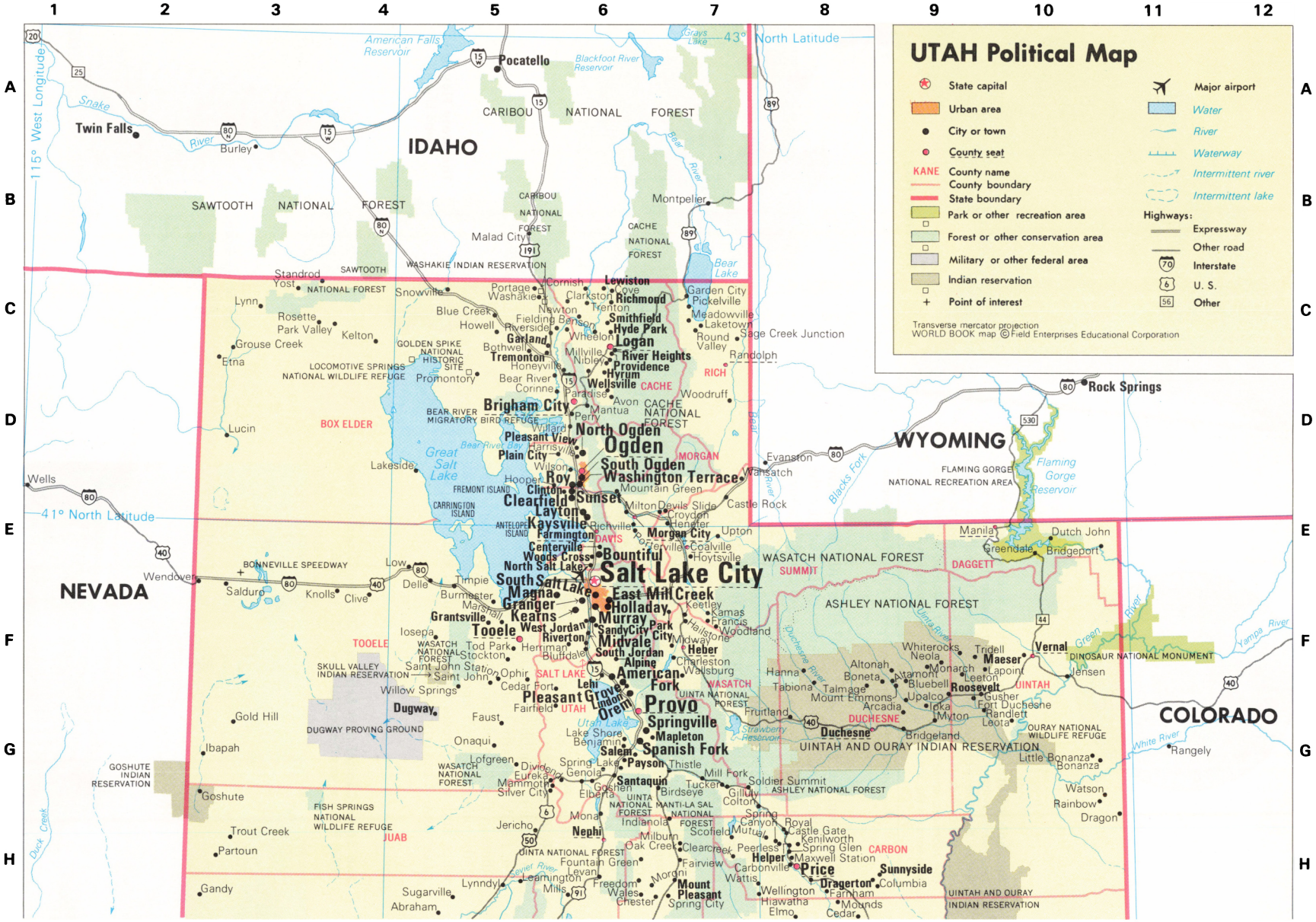
The State Bird
Sea Gull

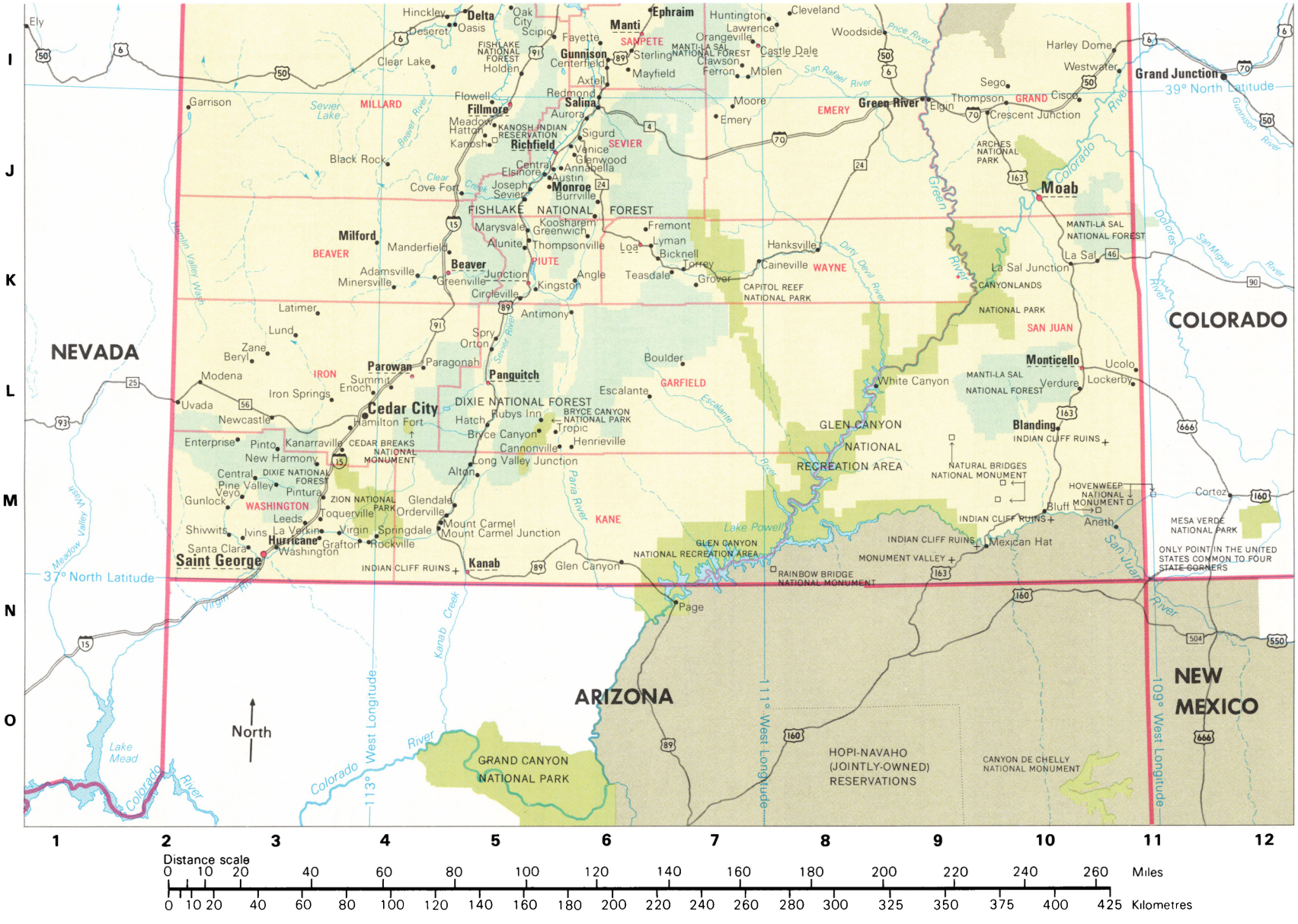
The State Flower
Sego Lily

The State Tree
Blue Spruce

The State Capitol is in Salt Lake City, Utah's capital since 1856. Fillmore was the capital from 1851 to 1856.

Utah Tourist and Publicity Council


UTAH Political Map
State capital
Urban area
City or town
County seat
KANE County name
County boundary
State boundary
Park or other recreation area
Forest or other conservation area
Military or other federal area
Indian reservation
Point of interest
Major airport
Water
River
Waterway
Intermittent river
Intermittent lake
Highways:
Expressway
Other road
Interstate
U. S.
Other
Transverse mercator projection
WORLD BOOK map ©Field Enterprises Educational Corporation
IDAHO
WYOMING
NEVADA
COLORADO
Salt Lake City
Ogden
Provo
Logan
Brigham City
Tooele
Price
Vernal
Roosevelt
Rock Springs
Pocatello
Twin Falls
American Falls Reservoir
Blackfoot River Reservoir
Bear Lake
Great Salt Lake
Flaming Gorge Reservoir
CARIBOU NATIONAL FOREST
SAWTOOTH NATIONAL FOREST
CACHE NATIONAL FOREST
WASATCH NATIONAL FOREST
ASHLEY NATIONAL FOREST
UINTA NATIONAL FOREST
MANTI-LA SAL NATIONAL FOREST
WASHAKIE INDIAN RESERVATION
GOSHUTE INDIAN RESERVATION
SKULL VALLEY INDIAN RESERVATION
UINTAH AND OURAY INDIAN RESERVATION
DINOSAUR NATIONAL MONUMENT
FLAMING GORGE NATIONAL RECREATION AREA
BONNEVILLE SPEEDWAY
DUGWAY PROVING GROUND
FISH SPRINGS NATIONAL WILDLIFE REFUGE
LOCOMOTIVE SPRINGS NATIONAL WILDLIFE REFUGE
GOLDEN SPIKE NATIONAL HISTORIC SITE
BEAR RIVER MIGRATORY BIRD REFUGE
OURAY NATIONAL WILDLIFE REFUGE
43° North Latitude
41° North Latitude
115° West Longitude


NEVADA
COLORADO
ARIZONA
NEW MEXICO
North
37° North Latitude
39° North Latitude
111° West Longitude
113° West Longitude
109° West Longitude
Ely
Hinckley
Delta
Oasis
Deseret
Oak City
Scipio
Fayette
Ephraim
Manti
SANPETE
Huntington
Cleveland
Lawrence
Orangeville
Castle Dale
Woodside
Price River
Harley Dome
Westwater
Grand Junction
Clear Lake
FISHLAKE NATIONAL FOREST
Holden
Gunnison
Centerfield
Sterling
MANTI-LA SAL NATIONAL FOREST
Clawson
Ferron
Molen
Mayfield
Axtell
San Rafael River
Sego
Cisco
Thompson
GRAND
Crescent Junction
Green River
Elgin
EMERY
Moore
Emery
Garrison
Sevier Lake
MILLARD
Beaver River
Flowell
Fillmore
Meadow
Hatton
Kanosh
KANOSH INDIAN RESERVATION
Richfield
Redmond
Salina
Aurora
Sigurd
SEVIER
Venice
Glenwood
Annabella
Black Rock
Central
Elsinore
Austin
Clear Creek
Cove Fort
Joseph
Sevier
Monroe
Burrville
FISHLAKE NATIONAL FOREST
Marysvale
Koosharem
Greenwich
Fremont
Lyman
Bicknell
Loa
Torrey
Grover
Hanksville
Dirty Devil River
Caineville
WAYNE
Teasdale
Milford
BEAVER
Manderfield
Alunite
Thompsonville
Beaver
Junction
Greenville
PIUTE
Angle
Kingston
Adamsville
Minersville
Circleville
Antimony
CAPITOL REEF NATIONAL PARK
ARCHES NATIONAL PARK
Moab
Green River
Colorado River
MANTI-LA SAL NATIONAL FOREST
La Sal
La Sal Junction
CANYONLANDS NATIONAL PARK
SAN JUAN
Dolores River
San Miguel River
Gunnison River
Latimer
Lund
Zane
Beryl
Spry
Orton
Sevier River
Paragonah
Parowan
Modena
IRON
Summit
Enoch
Panguitch
Boulder
GARFIELD
Escalante
Escalante River
White Canyon
MANTI-LA SAL NATIONAL FOREST
Verdure
Monticello
Ucolo
Lockerby
Uvada
Iron Springs
Cedar City
DIXIE NATIONAL FOREST
Newcastle
Hamilton Fort
Hatch
Rubys Inn
BRYCE CANYON NATIONAL PARK
Bryce Canyon
Tropic
Henrieville
Cannonville
Enterprise
Pinto
Kanarraville
CEDAR BREAKS NATIONAL MONUMENT
New Harmony
Long Valley Junction
Alton
GLEN CANYON NATIONAL RECREATION AREA
Blanding
INDIAN CLIFF RUINS
NATURAL BRIDGES NATIONAL MONUMENT
HOVENWEEP NATIONAL MONUMENT
Central
DIXIE NATIONAL FOREST
Pine Valley
Veyo
Pintura
Gunlock
WASHINGTON
ZION NATIONAL PARK
Glendale
Orderville
Toquerville
Leeds
Para River
KANE
Cortez
Bluff
Aneth
MESA VERDE NATIONAL PARK
Shivwits
Ivins
La Verkin
Virgin
Springdale
Mount Carmel
Mount Carmel Junction
Hurricane
Grafton
Rockville
Santa Clara
Saint George
Washington
Virgin River
Meadow Valley Wash
Hamlin Valley Wash
Kanab
INDIAN CLIFF RUINS
Kanab Creek
Glen Canyon
Lake Powell
GLEN CANYON NATIONAL RECREATION AREA
RAINBOW BRIDGE NATIONAL MONUMENT
Page
Mexican Hat
MONUMENT VALLEY
San Juan River
ONLY POINT IN THE UNITED STATES COMMON TO FOUR STATE CORNERS
Lake Mead
Colorado River
GRAND CANYON NATIONAL PARK
HOPI-NAVAHO (JOINTLY-OWNED) RESERVATIONS
CANYON DE CHELLY NATIONAL MONUMENT
Distance scale
0 10 20 40 60 80 100 120 140 160 180 200 220 240 260 Miles
0 10 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 325 350 375 400 425 Kilometres

UTAH MAP INDEX

Population

1,059,273	Census 1970
890,627	" 1960
688,862	" 1950
550,310	" 1940
507,847	" 1930
449,396	" 1920
373,351	" 1910
276,749	" 1900
210,779	" 1890
143,963	" 1880
86,786	" 1870
40,273	" 1860
11,380	" 1850

Metropolitan Areas

Provo-Orem	137,776
Salt Lake City-Ogden	705,458

Counties

Beaver	3,800	K 3
Box Elder	28,129	D 3
Cache	42,331	D 6
Carbon	15,647	H 9
Daggett	666	E 9
Davis	99,028	E 6
Duchesne	7,299	G 8
Emery	5,137	I 8
Garfield	3,157	L 7
Grand	6,688	I 10
Iron	12,177	L 3
Juab	4,574	H 4
Kane	2,421	M 6
Millard	6,988	I 4
Morgan	3,983	D 7
Piute	1,164	K 5
Rich	1,615	D 7
Salt Lake	458,607	F 6
San Juan	9,606	K 10
Sanpete	10,976	I 6
Sevier	10,103	J 6
Summit	5,879	E 8
Tooele	21,545	F 4
Uintah	12,684	F 10
Utah	137,776	G 6
Wasatch	5,863	F 7
Washington	13,669	M 3
Wayne	1,483	K 8
Weber	126,278	D 7

Cities and Towns

Abraham		H 4
Adamsville		K 4
Alpine	1,047	F 6
Alta*	93	F 6
Altamont	129	F 9
Alton	62	M 5
Altonah		F 9
Amalga*	207	C 6
American Fork	7,713	F 6
Aneth		M 11
Angle		K 6
Annabella	221	J 6
Antimony	113	K 6
Arcadia		G 9
Aurora	493	J 6
Austin		J 6
Avon		D 6
Axtell		I 6
Bear River	445	D 6
Beaver	1,453 °K	5
Benjamin		G 6
Benson		C 6
Beryl		L 3
Bicknell	264	K 6
Bingham Canyon*	31	F 6
Birdseye		G 7
Black Rock		J 4
Blanding	2,250	L 10
Blue Creek		C 5
Bluebell		F 9
Bluff		M 10
Bluffdale		F 6
Bonanza		G 11
Boneta		F 9
Bothwell		C 5
Boulder	93	L 7
Bountiful	27,751	E 6
Bridgeland		G 9
Bridgeport		E 11
Brigham City	14,007 °D	6
Bryce Canyon		L 5
Burmester		F 5
Burrville		J 6
Caineville		K 7
Cannonville	113	M 6
Carbonville		H 8
Castle Dale	541 °I	7
Castle Gate	205	H 8
Castle Rock		E 7
Cedar		H 8
Cedar City	8,946	L 4
Cedar Fort	188	F 6
Centerfield	419	I 6
Centerville	3,268	E 6
Central		J 6
Central	32	M 3
Charleston	196	F 7
Chester		H 6
Circleville	443	K 5
Cisco		I 10
Clarkston	420	C 6
Clawson		I 7
Clear Lake		I 4
Clearcreek		H 7
Clearfield	13,316	E 6
Cleveland	244	I 8
Clinton	1,768	E 6
Clive		F 4
Coalville	864 °E	7
Colton		G 7
Columbia		H 9
Corinne	471	D 6
Cornish	173	C 6
Cottonwood*	8,431	F 6
Cove		C 6
Cove Fort		J 5
Crescent Junction		J 10
Croydon		E 7
Defas Park*		G 6
Delle		E 4
Delta	1,610	I 5
Deseret		I 5
Devils Slide		E 7
Deweyville*	248	C 6
Dividend		G 6
Dragerton	1,614	H 8
Dragon		H 11
Duchesne	1,094 °G	8
Dugway	2,357	G 4
Dutch John		E 10
East Layton*	763	E 6
East Mill Creek	26,579	F 6
Elberta		G 6
Elgin		I 9
Elmo	141	H 8
Elsinore	357	J 5
Elwood*	294	C 5
Emery	216	J 7
Enoch	120	L 4
Enterprise	844	M 3
Ephraim	2,127	I 6
Escalante	638	L 6
Etna		C 2
Eureka	753	G 5
Fairfield		G 6
Fairview	696	H 7
Farmington	2,526 °E	6
Farnham		H 8
Faust		G 5
Fayette	93	I 6
Ferron	663	I 7
Fielding	254	C 6
Fillmore	1,411 °I	5
Flowell		I 5
Fort Duchesne		G 9
Fountain Green	467	H 6
Francis	268	F 7
Freedom		H 6
Fremont		K 6
Fruit Heights*	800	E 6
Fruitland		G 8
Gandy		H 2
Garden City	134	C 7
Garland	1,187	C 5
Garrison		I 2
Genola	424	G 6
Gilluly		G 7
Glen Canyon		N 6
Glendale	200	M 5
Glenwood	212	J 6
Gold Hill		G 3
Goshen	459	G 6
Goshute		G 2
Grafton		M 4
Granger [-Hunter]	9,029	F 6
Granite Park*	9,573	F 6
Grantsville	2,931	F 5
Green River	1,033	I 9
Greendale		E 10
Greenville		K 4
Greenwich		K 6
Grouse Creek		C 3
Grover		K 7
Gunlock		M 2
Gunnison	1,073	I 6
Gusher		F 9
Hailstone		F 7
Hamilton Fort		L 4
Hanksville		K 8
Hanna		F 8
Harley Dome		I 11
Harrisville	747	D 6
Hatch	139	L 5
Hatton		J 5
Heber	3,245 °F	7
Helper	1,964	H 8
Henefer	446	E 7
Henrieville	145	M 6
Herriman		F 6
Hiawatha	166	H 7
Hilldale*	480	M 4
Hinckley	400	I 5
Holden	351	I 5
Holladay	23,014	F 6
Honeyville	640	C 6
Hooper		E 5
Howell	146	C 5
Hoytsville		E 7
Hunter, see Granger [-Hunter]		
Huntington	857	I 7
Huntsville*	553	D 6
Hurricane	1,408	M 3
Hyde Park	1,025	C 6
Hyrum	2,340	D 6
Ibapah		G 2
Indianola		H 7
Ioka		G 9
Iosepa		F 4
Iron Springs		L 3
Ivins	137	M 3
Jensen		F 10
Jericho		H 5
Joseph	125	J 5
Junction	135 °K	5
Kamas	806	F 7
Kanab	1,381 °N	5
Kanarraville	204	M 4
Kanosh	319	J 5
Kaysville	6,192	E 6
Kearns	17,247	F 6
Keetley		F 7
Kelton		C 4
Kenilworth		H 8
Kingston	114	K 5
Knolls		F 4
Koosharem	141	J 6
Lake Shore		G 6
Lakeside		D 4
Laketown	208	C 7
Lapoint		F 9
La Sal		K 10
La Sal Junction		K 10
Latimer		K 3
La Verkin	463	M 3
Lawrence		I 7
Layton	13,603	E 6
Leamington	112	H 5
Leeds	151	M 3
Leeton		F 9
Lehi	4,659	F 6
Leota		G 10
Levan	376	H 6
Lewiston	1,244	C 6
Lindon	1,644	F 6
Little Bonanza		G 10
Loa	324 °K	6
Lockerby		L 11
Lofgreen		G 5
Logan	22,333 °C	6
Long Valley Junction		M 5
Low		E 4
Lucin		D 3
Lund		L 3
Lyman		K 6
Lynn		C 3
Lynndyl	111	H 5
Maeser	1,248	F 10
Magna	5,509	F 6
Mammoth		G 5
Manderfield		K 5
Manila	226 °E	10
Manti	1,803 °I	6
Mantua	413	D 6
Mapleton	1,980	G 6
Marshall		F 5
Marysvale	289	K 5
Maxwell Station		H 8
Mayfield	267	I 6
Meadow	238	J 5
Meadowville		C 7
Mendon*	345	C 6
Mexican Hat		M 10
Midvale	7,840	F 6
Midway	804	F 7
Milburn		H 7
Milford	1,304	K 4
Mill Fork		G 7
Mills		H 6
Millville	441	C 6
Milton		E 6
Minersville	448	K 4
Moab	4,793 °J	10
Modena		L 2
Molen		I 7
Mona	309	H 6
Monarch		F 9
Monroe	918	J 6
Monticello	1,431 °L	10
Moore		I 7
Morgan City	1,586 °E	6
Moroni	894	H 6
Mounds		H 8
Mount Carmel		M 4
Mount Carmel Junction		M 4
Mount Emmons		F 9
Mount Olympus*	5,909	F 6
Mount Pleasant	1,516	H 7
Mountain Green		E 6
Murray	21,206	F 6
Mutual		H 7
Myton	322	G 9
Neola		F 9
Nephi	2,699 °H	6
New Harmony	78	M 3
Newcastle		L 3
Newton	444	C 6
Nibley	367	C 6
North Logan*	1,405	C 6
North Ogden	5,257	D 6
North Salt Lake	2,143	E 6
Oak City	278	I 5
Oak Creek		H 7
Oakley*	265	E 7
Oasis		I 5
Ogden	69,478 °D	6
Onaqui	541	G 5
Ophir	76	F 5
Orangeville	511	I 7
Orderville	399	M 5
Orem	25,729	F 6
Orton		L 5
Panguitch	1,318 °L	5
Paradise	399	D 6
Paragonah	275	L 4
Park City	1,193	F 7
Park Valley		C 3
Parowan	1,423 °L	4
Partoun		H 2
Payson	4,501	G 6
Peerless		H 8
Perry	909	D 6
Peterson*		E 6
Pickelville	106	C 7
Pine Valley		M 3
Pinto		M 3
Pintura		M 3
Plain City	1,543	D 6
Pleasant Grove	5,327	F 6
Pleasant View	2,021	D 6
Plymouth*	203	C 5
Portage	144	C 5
Porterville		E 6
Price	6,218 °H	8
Promontory		D 5
Providence	1,608	C 6
Provo	53,131 °G	6
Rainbow		G 10
Randlett		G 9
Randolph	500 °C	7
Redmond	409	I 6
Richfield	4,471 °J	6
Richmond	1,000	C 6
Richville		E 6
River Heights	1,008	C 6
Riverdale*	3,704	D 6
Riverside		C 5
Riverton	2,820	F 6
Rockville		M 4
Roosevelt	2,005	F 9
Rosette		C 3
Round Valley		C 7
Roy	14,356	E 6
Royal		H 8
Rubys Inn		L 5
Sage Creek Junction		C 7
St. George	7,097 °N	3
St. John		F 5
St. John Station		F 5
Salduro		E 3
Salem	1,081	G 6
Salina	1,494	I 6
Salt Lake City	175,885 °E	6
Sandy City	6,438	F 6
Santa Clara	271	M 3
Santaquin	1,236	G 6
Scipio	264	I 6
Scofield	71	H 7
Sego		I 10
Sevier		J 5
Shivwits		M 3
Sigurd	291	J 6
Silver City		G 5
Smithfield	3,342	C 6
Snowville	174	C 5
Soldier Summit	13	G 7
South Jordan	2,942	F 6
South Ogden	9,991	D 6
South Salt Lake	7,810	F 6
South Weber*	1,073	E 6
Spanish Fork	7,284	G 6
Spring Canyon		H 8
Spring City	456	H 7
Spring Glen		H 8
Spring Lake		G 6
Springdale	172	M 4
Springville	8,790	G 6
Spry		L 5
Standrod		C 3
Sterling	144	I 6
Stockton	469	F 5
Sugarville		H 5
Summit		L 4
Sunnyside	485	H 9
Sunset	6,268	E 6
Syracuse*	1,843	E 6
Tabiona	125	F 8
Talmage		F 8
Teasdale		K 7
Thistle		G 7
Thompson		I 10
Thompsonville		K 5
Timpie		E 5
Tod Park		F 5
Tooele	12,539 °F	5
Toquerville	185	M 3
Torrey	84	K 7
Tremonton	2,794	C 5
Trenton	390	C 6
Tridell		F 9
Tropic	329	L 6
Trout Creek		H 3
Tucker		G 7
Ucolo		L 11
Uintah*	400	E 6
Upalco		G 9
Upton		E 7
Uvada		L 2
Venice		J 6
Verdure		L 10
Vernal	3,908 °F	10
Veyo		M 3
Virgin	119	M 4
Wahsatch		D 7
Wales	89	H 6
Wallsburg	211	F 7
Washakie		C 5
Washington	750	M 3
Washington Terrace	7,241	E 6
Watson		G 10
Wattis		H 7
Wellington	922	H 8
Wellsville	1,267	D 6
Wendover	781	E 2
West Bountiful*	1,246	E 6
West Jordan	4,221	F 6
West Point*	1,020	E 6
Westwater		I 11
Wheelon		C 6
White Canyon		L 8
White City*	6,402	F 6
Whiterocks		F 9
Willard	1,045	D 6
Willow Springs		F 5
Wilson		D 6
Woodland		F 7
Woodruff	173	D 7
Woods Cross	3,124	E 6
Woodside		I 9
Yost	51	C 3
Zane		L 3

*Does not appear on the map; key shows general location.
°County seat.

Source: Latest census figures (1970). Places without population figures are unincorporated areas and are not listed in census reports.

UTAH/People

The 1970 United States census reported that Utah had a population of 1,059,273. This census figure was an increase of 19 per cent over the 1960 figure of 890,627. The U.S. Bureau of the Census estimated that by 1975 Utah's population had reached about 1,146,000.

About four-fifths of Utah's people live in urban areas. That is, they live in or near cities and towns of 2,500 or more persons. The rest of the people live in rural areas. About four-fifths of the people live in the state's two Standard Metropolitan Statistical Areas (see METROPOLITAN AREA). For the populations of Utah's two metropolitan areas—Provo-Orem and Salt Lake City-Ogden—see the *Index* to the political map of Utah.

Salt Lake City is the capital and largest city of Utah. There are four other cities in the state with populations of more than 25,000. They are, in order of size, Ogden, Provo, Bountiful, and Orem. East Mill Creek, an unincorporated city, also has over 25,000 persons. See the separate articles on the cities of Utah listed in the *Related Articles* at the end of this article.

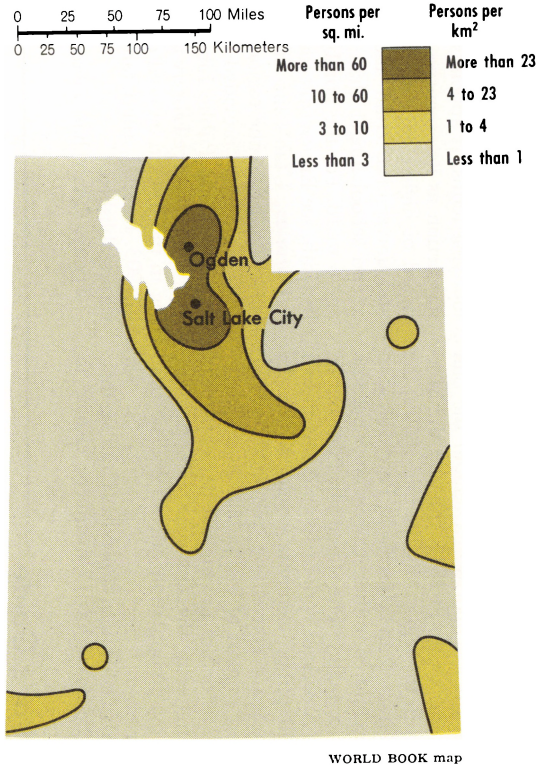
About 97 of every 100 persons living in Utah were born in the United States. The largest groups of persons born in other countries came from Canada, Germany, Great Britain, and The Netherlands.

About 70 per cent of Utah's people are Mormons. Most of the other church members are Roman Catholics or Protestants.

The Church of Jesus Christ of Latter-day Saints

POPULATION

This map shows the *population density* of Utah, and how it varies in different parts of the state. Population density means the average number of persons who live in a given area.



WORLD BOOK map

Mormons Gather in Salt Lake City's historic Temple Square, the symbolic center of Mormonism. The Sea Gull Monument, *left background,* honors the sea gulls that saved Utah's crops in 1848. The gulls ate swarms of grasshoppers that threatened the crops.

UTAH/Education

Schools. Utah's first school was a tent in the Salt Lake Valley. It was set up in 1847, the year the Mormons first settled in the region. By the mid-1850's, the Utah region had more than 200 schools. Parents had to pay to send their children to these early schools because of a shortage of tax money. The region's first free public school opened in American Fork in 1866. A law passed in 1890 made all public elementary schools free. In 1895, a constitutional convention provided for the establishment and support of free public high schools.

Today, Utah has one of the highest percentages of high school graduates in the United States. A larger percentage of Utah's population attends college than that of any other state.

The state board of education supervises Utah's public school system. The board has 11 members, elected to four-year terms. It appoints a superintendent of public instruction as its executive officer. A 15-member state board of higher education supervises Utah's colleges and universities. Utah and Ohio require children to attend school longer than do any other states—from age 6 to 18. For the number of teachers and students in Utah, see EDUCATION (table).

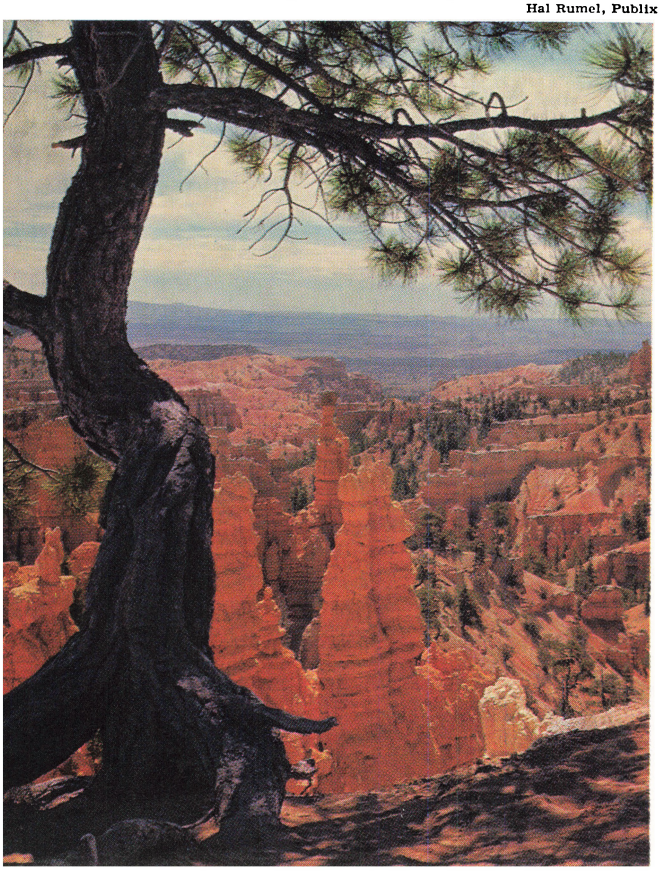
Libraries. Utah's first library was established with books hauled to the region by oxen in the 1850's. In 1897, a state law provided for free public libraries. The Salt Lake City Public Library opened the next year. The Carnegie Free Library in Ogden was the first building in the state to be used only as a library. It opened in 1903. In 1957, the Utah State Library Commission was established.

Today, Utah has more than 50 public libraries.

UTAH/A Visitor's Guide

Millions of tourists visit Utah every year. The state's forests, mountains, lakes, and rivers are excellent for boating, fishing, hunting, sightseeing, skiing, and swimming. One of Utah's most popular places to visit is the center of Mormonism—Temple Square in Salt Lake City. Three important Mormon church buildings stand in the square. These are the majestic Mormon Temple, which took 40 years to build; the Salt Lake Tabernacle, famous for its huge organ and choir; and the Visitor Center. The Temple is not open to the general public.

Bryce Canyon National Park, Land of Brilliant Color
Hal Rumel, Publix



PLACES TO VISIT

Following are brief descriptions of some of Utah's many interesting places to visit.

Beehive House, in Salt Lake City, is the restored home of Brigham Young. This stately, two-story adobe house was built in 1855.

Bingham Canyon Copper Pit, near Salt Lake City, is the largest open-pit copper mine in North America. It is nearly $\frac{1}{2}$ mile (0.8 kilometer) deep, and over 2 miles (3 kilometers) across at its widest point.

Bonneville Speedway, near Wendover, is famous for its racing trials in August. The area has 100 square miles (260 square kilometers) of flat salt beds that are as hard as cement.

Goosenecks of the San Juan River, near Mexican Hat, form an area where the river winds its way through a canyon 1,200 feet (366 meters) deep.

Great Salt Lake, near Salt Lake City, has water four to five times saltier than any ocean.

Monument Valley, in southeastern Utah, has red sandstone formations that rise 1,000 feet (300 meters). In the evening, a formation called the *totem pole* casts a shadow 35 miles (56 kilometers) long.

Ruins of Indian Cliff Dwellings line mountain ledges near Blanding, Bluff, Kanab, Moab, Parowan, Price, and Vernal. These cliff dwellings housed Indians who lived in the Utah region hundreds of years ago.

National Parks, Monuments, and Forests. Utah has five national parks—Arches, Bryce Canyon, Canyonlands, Capitol Reef, and Zion. The state shares Dinosaur and Hovenweep national monuments with Colorado. Other Utah national monuments are Cedar Breaks, Natural Bridges, Rainbow Bridge, and Timpanogos Cave. The Golden Spike National Historic Site is at Promontory. Utah shares the Glen Canyon National Recreation Area with Arizona. There are nine national forests in Utah—Ashley, Cache, Caribou, Dixie, Fishlake, Manti-LaSal, Sawtooth, Uinta, and Wasatch. See NATIONAL FOREST (table).

State Parks. Utah has 43 state parks. For information on these parks, write to Director, State Park and Recreation Commission, 1596 W. North Temple, Salt Lake City, Utah 84116.

Brigham Young University, in Provo, and the Latter-day Saints Church Historian's Office and the Utah State Historical Society's Morgan Memorial Library, both in Salt Lake City, have large collections of Mormon literature. The Latter-day Saints Genealogical Society Library in Salt Lake City has an extensive collection of genealogical records and research.

Museums. Outstanding collections of paintings may be seen at the Utah Museum of Fine Arts of the University of Utah, the Salt Lake Art Center, and the Utah State Institute of Fine Arts—all in Salt Lake City. Museums operated by Brigham Young University in Provo and the Springville Museum of Art also have excellent collections. The Temple Square Bureau of Information and Museum in Salt Lake City has exhibits of Mormon pioneer life. Also in Salt Lake City are a museum maintained by the Daughters of Utah Pioneers Association, and a pioneer village operated by the National Society of the Sons of Utah Pioneers.

UNIVERSITIES AND COLLEGES

Utah has six universities and colleges accredited by the Northwest Association of Secondary and Higher Schools. For enrollments and further information, see UNIVERSITIES AND COLLEGES (table).

Name	Location	Founded
Brigham Young University	Provo	1875
Southern Utah State College	Cedar City	1965
Utah, University of	Salt Lake City	1850
Utah State University	Logan	1888
Weber State College	Ogden	1889
Westminster College	Salt Lake City	1875

ANNUAL EVENTS

Each July, Utahans observe the 1847 arrival of Mormon pioneers in the Salt Lake Valley. Many Utah cities stage celebrations. The symphony season at the Salt Lake Tabernacle extends from November to March.

Other annual events in Utah include the following.

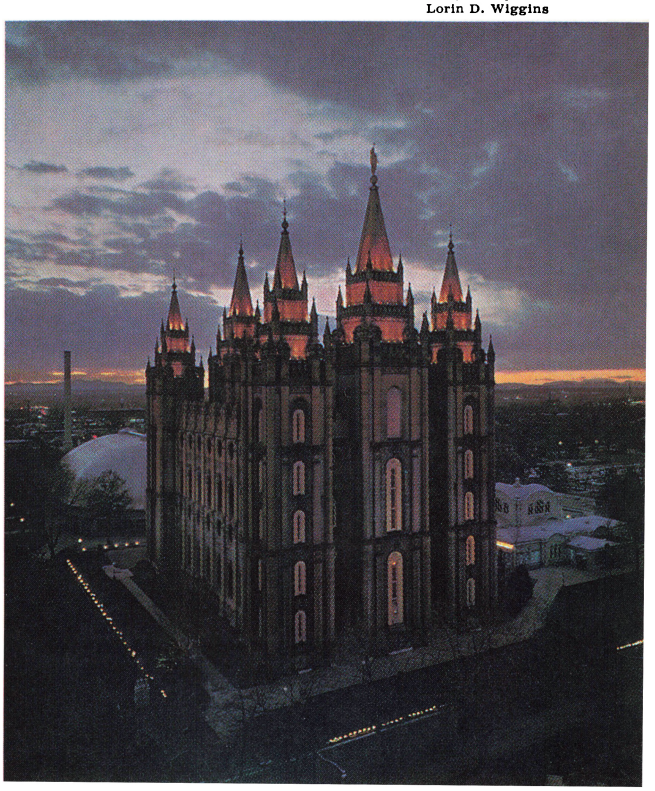
January-April: Statehood Day Celebration in Salt Lake City (January 4); Utah Winter Carnival in many cities (February); Ute Tribal Bear Dance in Duchesne (April); National Art Exhibit in Springville (April).

May-August: Intermountain Utah Boat, Sports, and Travel Show in Salt Lake City (May); Friendship Cruise in Green River (May); Uinta Basin Junior Livestock and Horse Show in Vernal (May); Re-enactment of the Driving of the Golden Spike at Promontory (May 10); Strawberry Days Festival in Pleasant Grove (June); All Tribes Indian Days in Bluff (June); Ute Tribal Sun Dance near Whiterocks (July); Shakespearean Drama Festival in Cedar City (second week in July); Park City Art Festival (August); Bonneville National Speed Trials on Bonneville Speedway (second week in August to September 1).

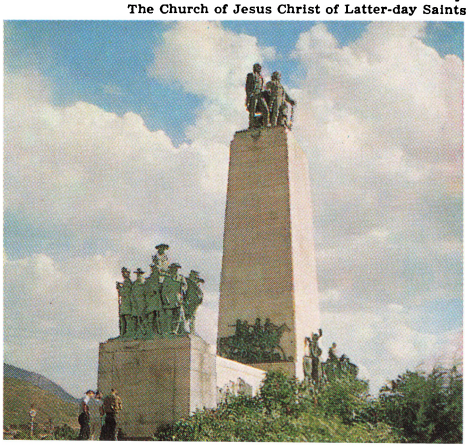
September-December: Cache Valley Threshing Bee in Logan (September); Utah Repertory Dance Theatre in Salt Lake City (November); Civic Oratorio, *The Messiah*, in the Salt Lake Tabernacle in Salt Lake City (Sunday before Christmas).

The Church of Jesus Christ of Latter-day Saints
Brigham Young University Library in Provo

Mormon Temple in Salt Lake City's Temple Square
Lorin D. Wiggins



Pioneer Trails State Park in Salt Lake City
The Church of Jesus Christ of Latter-day Saints



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Land Regions. Utah includes parts of three major land regions: (1) the Rocky Mountains, (2) the Basin and Range Region, and (3) the Colorado Plateau.

The Rocky Mountains extend generally north and south across a large part of western North America. In Utah, two ranges of the Rocky Mountains—the Uinta and the Wasatch—form an angle in the northeast corner of the state. The Uinta Range extends westward from Colorado almost to Salt Lake City. It is the only major range of the Rocky Mountains that runs east and west. Several peaks in the Uinta Range are more than 13,000 feet (3,960 meters) high. Kings Peak, the highest point in Utah, rises 13,528 feet (4,123 meters) near the center of the range. Many lakes and flat-bottomed canyons in the Uinta Range were formed by glaciers that once covered the area.

The Wasatch Range extends from Mount Nebo, near Nephi, northward into Idaho. The western side of this rugged range is very steep. It rises 6,000 to 8,000 feet (1,800 to 2,400 meters) above the valleys that border it. The Wasatch Range also has many canyons. The canyons provide water and serve as recreation areas for the people in Utah's largest cities, just west of the mountains. Some of the canyons were formed by glaciers. The Ogden, Provo, and Weber Canyons were cut by rivers.

The Basin and Range Region covers parts of several states, including the western part of Utah. It is one of the driest regions in the United States. Small mountain ranges and broad basins cover the center of the region. Higher ranges and plateaus border it on the east and the west. Great Salt Lake lies in the northeast part of the region. West and southwest of the lake is a barren area called the Great Salt Lake Desert. The desert has about 4,000 acres (1,600 hectares) of flat salt beds that are as hard as concrete.

The extreme southwestern corner of Utah's Basin and Range region is known as *Utah's Dixie*. The early settlers grew cotton and grapes there.

The Colorado Plateau stretches over parts of Utah, Arizona, Colorado, and New Mexico. It covers most of the southern and eastern sections of Utah. This region consists of broad, rough uplands cut by deep canyons and valleys. High plateaus in the western part of the region include the Aquarius, Fish Lake, Markagunt, Paunsagunt, Pavant, Sanpitch, Sevier, and Tushar. These plateaus have elevations of more than 11,000 feet (3,350 meters). The famous Bryce, Cedar Breaks, and Zion canyons are in this area. The Henry Mountains rise west of the Colorado River, and the Abajo and La Sal mountains are east of the river. Utah's southeastern corner meets the corners of Arizona, New Mexico, and Colorado. This is the only point in the United States where four states meet (see ARIZONA [picture: Four Corners]).

Rivers and Lakes. Utah's rivers are used to provide irrigation for great stretches of farmland that otherwise would be desert. The Colorado River and its main tributary, the Green River, are the largest rivers in the state. These rivers and their many branches drain the eastern half of Utah. The Snake River of Idaho and its branches drain Utah's northwest corner. The Bear, Provo, and Weber rivers begin in the Uinta Range and flow through the Wasatch Mountains into Great Salt Lake. The Sevier is the chief river of south-central Utah. It begins in the Paunsagunt Plateau and flows north, then bends to the southwest. Most of the Basin and Range Region, which extends across several western states, has no outlet to the sea. It is the largest area of interior drainage in the United States.

Thousands of years ago, a huge body of fresh water

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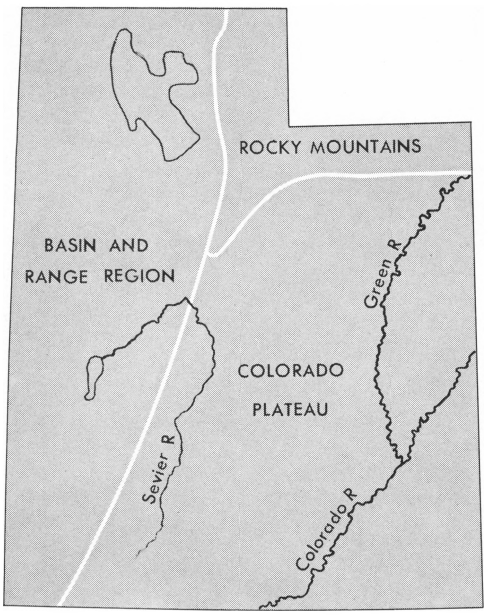
Land Regions of Utah

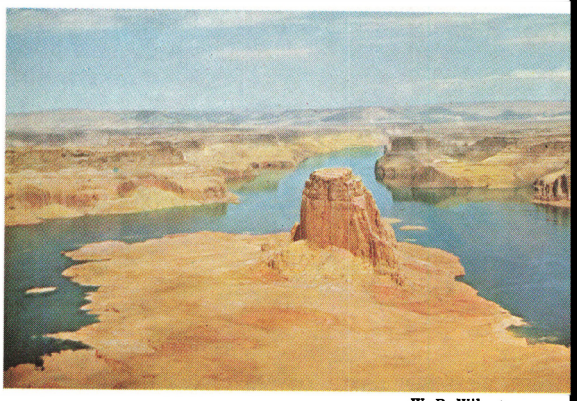


covered parts of Utah. Scientists have named this ancient sea Lake Bonneville. The Bonneville Salt Flats, in the middle of the Great Salt Lake Desert, cover part of the bed of Lake Bonneville. Great Salt Lake and Utah Lake are also part of what remains of Lake Bonneville. Great Salt Lake is the largest natural lake west of the Mississippi River. It is four to five times as salty as the ocean, and becomes even saltier when the water level drops during dry periods. Great Salt Lake is salty because its waters are not drained by outflowing streams. Instead, some of the water evaporates and leaves salt deposits behind. The Jordan River drains Utah Lake and keeps its waters fresh. Utah Lake and Bear Lake, which Utah shares with Idaho, are important reservoirs in which irrigation waters are stored. Many small lakes lie in the Boulder, Uinta, and Wasatch mountains.

Deserts cover about a third of Utah. Few plants can grow in these deserts because of the lack of rainfall. The Great Salt Lake Desert lies west and south of Great Salt Lake. Other deserts include the Sevier Desert in west-central Utah, and the Escalante Desert in the southwestern part of the state.

Lorin D. Wiggins

Bear River, fed by melting snow, offers excellent fishing in the Uinta Mountains of Utah's Rocky Mountains region.



W. R. Wilson

Lake Powell, in the Colorado Plateau region, was formed by Glen Canyon Dam on the Colorado River in Arizona.

Great White Throne, *left,* rises nearly ½ mile (0.8 kilometer) from the canyon floor in Zion National Park. Zion Canyon in the Basin and Range Region is a spectacular example of river erosion.

Union Pacific Railroad

UTAH / *Climate*

Average July temperatures in Utah range from 60° F. (16° C) in the northeast to 84° F. (29° C) in the southwest. January temperatures average 20° F. (−7° C) in the north and 39° F. (4° C) in the southwest. Utah's record high temperature, 116° F. (47° C), occurred at St. George on June 28, 1892. The state's lowest temperature was −50° F. (−46° C), at Woodruff on Feb. 6, 1899, and at Strawberry Tunnel on Jan. 5, 1913.

Yearly *precipitation* (rain, melted snow, and other moisture) varies from less than 5 inches (13 centimeters) in the Great Salt Lake Desert to up to 50 inches (130 centimeters) in the northeast. The southwest gets little snow, but Alta, a ski area near Salt Lake City, has over 400 inches (1,000 centimeters) a year.

FPG

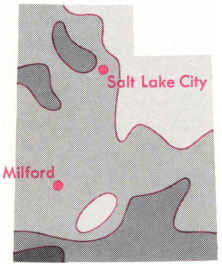
A Hot, Dry Climate causes the Great Salt Lake Desert to crack and makes it one of the most desolate regions in the world.

SEASONAL TEMPERATURES

January

AVERAGE OF DAILY LOW TEMPERATURES

Degrees Celsius	Degrees Fahrenheit
-4 to 0	24 to 32
-9 to -4	16 to 24
-13 to -9	8 to 16
-18 to -13	0 to 8



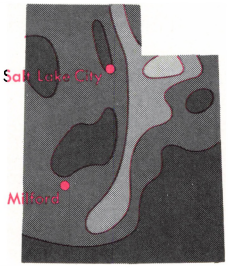
AVERAGE OF DAILY HIGH TEMPERATURES

Degrees Fahrenheit	Degrees Celsius
44 to 52	9 to 11
38 to 44	3 to 9
28 to 38	-2 to 3
20 to 28	-7 to -2

July

AVERAGE OF DAILY LOW TEMPERATURES

Degrees Celsius	Degrees Fahrenheit
20 to 27	68 to 80
13 to 20	56 to 68
7 to 13	44 to 56
0 to 7	32 to 44



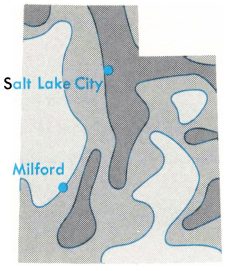
AVERAGE OF DAILY HIGH TEMPERATURES

Degrees Fahrenheit	Degrees Celsius
92 to 104	33 to 40
80 to 92	27 to 33
68 to 80	20 to 27
56 to 68	13 to 20

AVERAGE YEARLY PRECIPITATION

(Rain, Melted Snow and Other Moisture)

Centimeters	Inches
41 to 81	16 to 32
20 to 41	8 to 16
0 to 20	0 to 8



0 100 200 Miles
0 100 200 300 Kilometers

WORLD BOOK maps

AVERAGE MONTHLY WEATHER

SALT LAKE CITY

	Temperatures F° High	Temperatures F° Low	Temperatures C° High	Temperatures C° Low	Days of Rain or Snow
JAN.	36	17	2	-8	10
FEB.	43	24	6	-4	8
MAR.	52	30	11	-1	9
APR.	63	37	17	3	9
MAY	73	45	23	7	8
JUNE	82	58	28	14	5
JULY	92	61	33	16	5
AUG.	90	59	32	15	6
SEPT.	79	49	26	9	4
OCT.	67	39	19	4	7
NOV.	50	29	10	-2	7
DEC.	40	23	4	-5	9

MILFORD

	Temperatures F° High	Temperatures F° Low	Temperatures C° High	Temperatures C° Low	Days of Rain or Snow
JAN.	36	12	2	-11	8
FEB.	43	19	6	-7	5
MAR.	53	25	12	-4	6
APR.	64	32	18	0	4
MAY	74	40	23	4	6
JUNE	84	48	29	9	2
JULY	93	56	34	13	5
AUG.	89	54	32	12	4
SEPT.	81	44	27	7	2
OCT.	67	33	19	1	4
NOV.	53	22	12	-6	4
DEC.	41	15	5	-9	4

Utah's economy depends largely on manufacturing, mining, and agricultural activities in the northern and central parts of the state. Most of the irrigated farmland in Utah lies in a north-south line across the center of the state.

Natural Resources of Utah include rich mineral deposits, soils, forests, and plant and animal life.

Minerals. Bingham Canyon has rich deposits of copper, gold, lead, molybdenum, silver, and zinc. Coal, natural gas, and oil are found in the Colorado Plateau. Sand and gravel deposits are found throughout the state. Utah has one of the nation's richest deposits of oil shale, a rock that may someday be used as a source of oil. The Escalante Desert in the southwest has large supplies of iron ore. Other Utah minerals include beryllium, clay, gilsonite, gypsum, potassium salts, salt, stone, uranium, and vanadium.

Soils of Utah are generally poor for farming. Most of the mountain soils are poorly developed. Valley soils are often mixtures of sand, gravel, and clay carried down by mountain streams. Where water is available these valley soils can produce good crops.

Forests cover about 15 million acres (6 million hectares), or about 30 per cent of the state. The forest land is found in the mountains. Common trees include aspens, firs, junipers, pines, and spruces.

Other Plant Life. Many kinds of grasses, shrubs, and wild flowers grow in the mountains. The dry sections of the state have cactus, creosote bush, greasewood, mesquite, and shadscale. The wetter sections have grasses and sagebrush.

Animal Life. Common small animals in Utah include badgers, foxes, martens, muskrats, rabbits, ring-tailed cats, skunks, and weasels. Among the larger animals are black bears, bobcats, coyotes, lynxes, and mountain lions. The mule deer is the most common game animal. Buffaloes, elks, moose, and pronghorns are also found in the state. Ducks, geese, grouse, pheasants, and quail are common game birds of Utah. The state has such reptiles as lizards, toads, tortoises, and several kinds of snakes. Trout is the most common fish. Others include bass, catfish, graylings, perch, and whitefish.

Manufacturing, including processing, accounts for about half the value of goods produced in Utah. Goods manufactured there have a *value added by manufacture* of about $865 million annually. This figure represents the value created in products by Utah's industries, not counting such costs as materials, supplies, and fuels. Utah's chief manufactured products, in order of importance, are (1) primary metals, (2) transportation equipment, and (3) food and food products.

Primary Metals industries in Utah turn out products that have a value added of about $127 million yearly. These industries smelt, refine, and roll metals. They also manufacture basic metal products such as castings. Plants near Magna are important processors of *nonferrous metals* (metals that do not contain iron). The Provo area is a center for processing coke, pig iron, and steel. Plants in Moab process uranium. The Moab area also has a large potash refinery. Plants in Salt Lake County refine copper and lead.

Transportation Equipment has a value added of about $115 million yearly. This industry developed during the mid-1950's when Utah factories began producing missile engines and parts. Missile production started to fall in the 1960's, when the need for the parts produced in Utah began to decline. But this industry still plays a major role in Utah's economy.

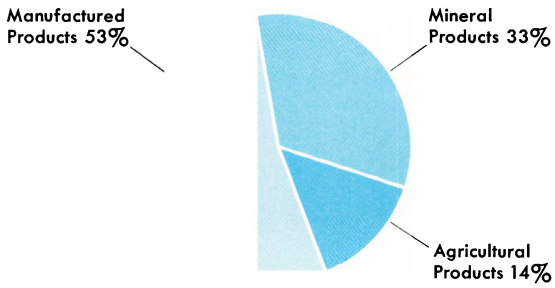
Food and Food Products in Utah have an annual value added of about $100 million. Plants in Salt Lake County process beet sugar, and meat and dairy products. Beet sugar is also processed in Garland. Ogden and Salt Lake City have large flour and feed mills and meat-packing plants. Smithfield has the largest Swiss cheese factory in the nation. Cache Valley in northeastern Utah is an important processor of dairy products. Factories in the state also can, freeze, and preserve fruits, poultry, and vegetables.

Other Leading Industries. The manufacture of nonelectrical machinery ranks fourth in importance in Utah. Other leading industries make electrical equipment and fabricated metal products. Printing and publishing are also important in the state.

Mining has an annual value of about $525 million, or about a third of the value of goods produced in Utah. Copper is the state's most valuable mineral, and Utah is second only to Arizona in copper production. Most of Utah's copper is taken from a huge open-pit

PRODUCTION OF GOODS IN UTAH

Total value of goods produced in 1971—$1,614,000,000



Percentages are based on farm income, value added by manufacture, and value of mineral production.
Sources: U.S. government publications, 1971-1973.

EMPLOYMENT IN UTAH

Total number of persons employed in 1972—404,000

	Number of Employees
Government	104,900
Wholesale & Retail Trade	91,100
Community, Business, & Personal Services	65,400
Manufacturing	59,400
Transportation & Public Utilities	24,300
Construction	20,600
Finance, Insurance, & Real Estate	17,300
Mining	12,100
Agriculture	8,900

Sources: *Employment and Earnings*, May, 1973, U.S. Bureau of Labor Statistics; U.S. Bureau of Employment Security.

mine in Bingham Canyon. Most of the state's petroleum, the second most valuable mineral, comes from San Juan and Uintah counties. Utah is among the leading producers of gold, iron ore, lead, uranium, and zinc. It is also among the leading coal producers west of the Mississippi River. Carbon and Emery counties supply nearly all the state's coal. All Utah's iron ore is mined in Iron County.

Duchesne and Uintah counties are the nation's only producers of gilsonite, a solid form of asphalt. The water of Great Salt Lake is used to produce natural salts. Utah is a leading producer of molybdenum, potassium salts, and silver. Nearly every Utah county produces sand and gravel.

Agriculture in Utah provides a yearly gross income of about $224 million. Farmland covers about 11 million acres (4.5 million hectares), or about a fifth of the state's land area. About 1 million acres (400,000 hectares) are irrigated by water stored in reservoirs. About 1½ million acres (600,000 hectares) can be farmed without irrigation by using dry farming methods (see DRY FARMING). Utah's 13,000 farms average 867 acres (351 hectares) in size. But most irrigated farms are under 200 acres (81 hectares). Many dry farms and ranches are much larger. And a few ranches are far above the average.

Livestock and Livestock Products have an annual value of about $185 million. Cattle and calves, Utah's leading farm products, earn about $82 million yearly. Milk is second, followed by turkeys and sheep. Eggs, hogs, and wool are other important livestock products. Utah is a leading wool-producing state, and a sheep-raising center of the western United States.

Crops have an annual value of about $46 million in Utah. Hay, the chief crop, earns about $10 million a year. Wheat is the second leading crop, and sugar beets rank third. Other important crops include apples, barley, cherries, greenhouse and nursery products, potatoes, and tomatoes. Most of the wheat and sugar beets come from the northern and central counties. Farmers in the north-central section raise apples, apricots, beans, cherries, corn, peaches, pears, peas, and tomatoes. The largest potato crops are in Beaver, Davis, Iron, Utah, and Washington counties. Farmers in the southwestern valleys of Utah raise almonds, cantaloupes, figs, and melons.

Electric Power. Most of Utah's generating plants are powered by coal or other fuels. Hydroelectric utilities generate the rest. Generators began producing power at Flaming Gorge in 1963 and at Glen Canyon in 1964.

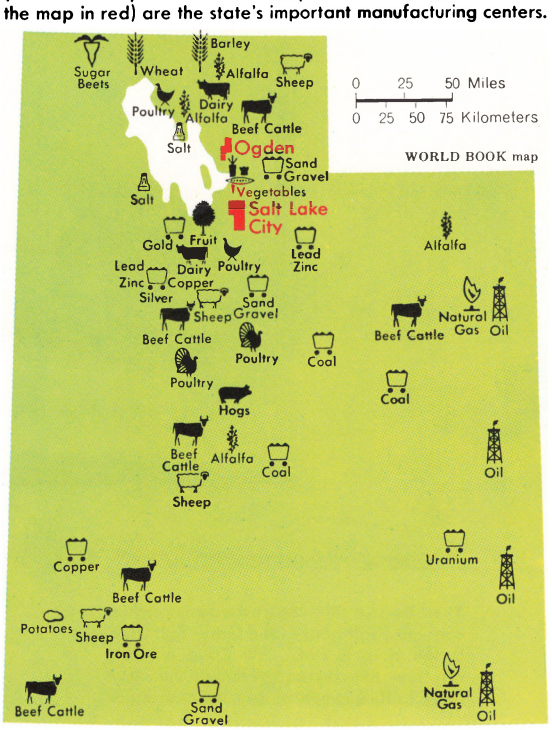
Transportation. The first transcontinental railroad system in the United States was completed in Utah on May 10, 1869. On that date, the Central Pacific and Union Pacific railroads were joined at Promontory.

Today, railroads operate on about 2,000 miles (3,200 kilometers) of track in Utah. Seven rail lines provide freight service, and passenger trains link Utah cities to other cities. The state also has about 40,000 miles (64,000 kilometers) of roads, and about 85 airports and airfields. The largest commercial airport is in Salt Lake City.

Communication. Utah's first newspaper, the *Deseret News*, was established in Salt Lake City in 1850. Today, the state has about 65 newspapers and 20 periodicals. The largest newspapers are the *Deseret News* and the *Salt Lake Tribune*, both of Salt Lake City. The state's first radio station, KZN (now KSL), began broadcasting in Salt Lake City in 1922. In 1948, Utah's first television station, KTVT (now KCPX-TV), began operating. Today, Utah has about 40 radio stations, 3 commercial television stations, and 2 educational TV stations.

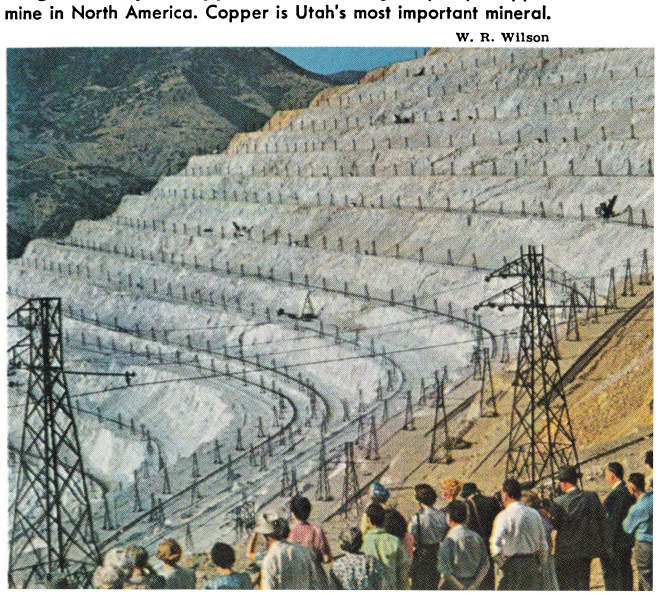
FARM AND MINERAL PRODUCTS

This map shows where the state's leading farm and mineral products are produced. The major urban areas (shown on the map in red) are the state's important manufacturing centers.



Bingham Canyon Copper Mine is the largest open-pit copper mine in North America. Copper is Utah's most important mineral.

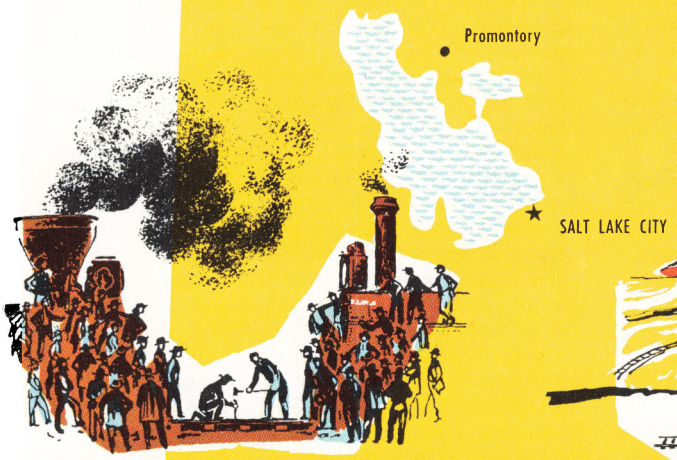
W. R. Wilson



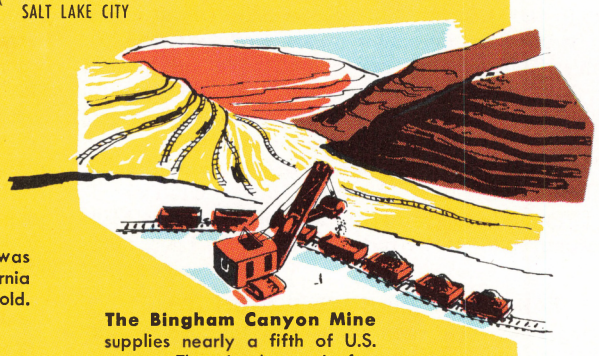
HISTORIC UTAH

"This Is The Place," Brigham Young, the Mormon leader, is supposed to have said on seeing the Great Salt Lake Valley. His pioneer party came to the site of Salt Lake City on July 24, 1847.

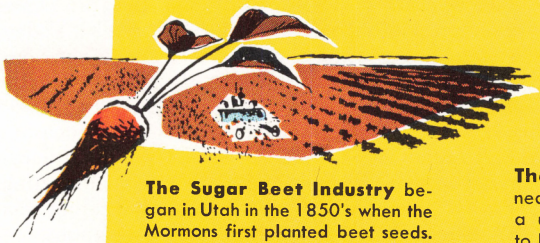
Jim Bridger, who later became a famous army scout, may have been the first white man to see Great Salt Lake. He reached its shores during the winter of 1824-1825.



The First U.S. Transcontinental Railroad System was completed at Promontory, Utah, on May 10, 1869. California Governor Stanford drove in the final spike, made of gold.

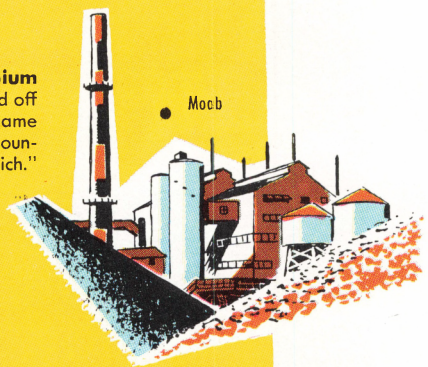


The Bingham Canyon Mine supplies nearly a fifth of U.S. copper. The mine boomed after surface mining began in 1906.

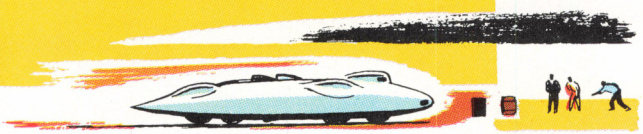


The Sugar Beet Industry began in Utah in the 1850's when the Mormons first planted beet seeds. The Lehi plant, opened in 1890, was the third in the country to succeed in beet-sugar manufacture.

The Discovery of Uranium near Moab in 1952 touched off a uranium rush. People came to Utah from all over the country hoping to "strike it rich."



The Mormons Began Irrigation of the land in Utah in 1847, the year of their arrival. They diverted City Creek, now in Salt Lake City, to flood the hard ground before plowing.



The Bonneville Speedway stretches over hard salt beds of the Great Salt Lake Desert. Here, in 1947, John Cobb, a British driver, was the first to travel more than 400 miles (640 kilometers) per hour on land.

Indian Days. Indians probably lived in the Utah region several thousand years ago. These early Indians made their homes in pueblos and in cliff dwellings. White explorers who came to the region in 1776 found four major tribes—the Gosiute, Paiute, Shoshoni (Snake), and Ute. The Navaho arrived in the 1860's, and now occupy large areas in southwestern Utah.

Early Exploration. In 1540, Spanish explorers arrived at the Grand Canyon in what is now Arizona. They may have traveled into the Utah region, although many historians doubt that they did. More than 235 years passed before white men again came to Utah. In 1776, while American colonists were fighting for their independence from Great Britain, two Spanish Franciscan friars led an expedition into the Utah region. They were Silvestre Velez de Escalante and Francisco Atanasio Domínguez. The friars explored the region and reached Utah Lake. Later, a few other Spaniards visited the region. But Spain was not interested in setting up colonies there. The first Americans to visit the region probably crossed what is now northern Utah in 1811-1812. They were part of a fur trading expedition.

Jim Bridger, a famous scout, was probably the first white man to see Great Salt Lake. He reached its shores during the winter of 1824-1825. Bridger tasted the salty water, and thought he had found an ocean. Hundreds of fur trappers and traders soon came to the Great Salt Lake area. By 1830, travelers were crossing central Utah to get from Santa Fe, in New Mexico, to Los Angeles.

The Mormons were Utah's first permanent settlers. This religious group belonged to the Church of Jesus Christ of Latter-day Saints. Joseph Smith established the church in Fayette, N.Y., in 1830. Brigham Young became leader of the Mormons after Smith's death in 1844. The Mormons were persecuted nearly everywhere they went. They traveled to Ohio, Missouri, and Illinois in search of religious freedom. In 1846, Young led a group of his people west. They reached the Great Salt Lake region in 1847, and Young settled there. He planned communities for all his followers. See MORMONS.

Many groups of Mormons settled in the valleys of north-central Utah. They irrigated the valleys and made farming productive. In 1848, swarms of grasshoppers invaded the valleys and threatened to ruin the settlers' crops. But sea gulls from Great Salt Lake wiped out the grasshoppers. The sea gull later became the state bird, and a monument was built in Salt Lake City to honor the gulls. The kind of grasshopper that attacked the settlers' crops became known as the Mormon cricket.

In 1849, the Mormons established their Perpetual Emigrating Fund. This fund helped bring to Utah many Mormons who could not pay for the trip. The fund operated for about 40 years. It brought about 50,000 Mormons to Utah, including many from Denmark, England, Norway, Scotland, Sweden, and Wales.

Indian Troubles. Relations between the Mormons and the Indians were peaceful at first. But some of the Indians resented the settlers who had taken their land. Beginning in 1853, a Ute chief named Walker led attacks against several Mormon settlements. These attacks were known as the *Walker War*. In 1854, Brigham Young persuaded Walker to end the attacks. For several years, the settlers and Indians lived peacefully. Another Ute chief, Black Hawk, led an uprising against the Mormon settlers in 1865. The attack started the Black Hawk War. Other tribes joined in the fighting. About 50 Mormons were killed, and the settlers suffered losses of more than $1 million. In 1867, talks between the Indians and the Mormons at Mount Pleasant in Sanpete County ended the war. Most of the Ute settled on a reservation in the Uinta Basin.

Territorial Days and Statehood. The Utah region belonged to Mexico when the Mormons first arrived in 1847. At the time, the United States and Mexico were fighting the Mexican War (1846-1848). The United States won the war and acquired from Mexico a large area of land, including the Utah region.

In 1849, the Mormons established the *State of Deseret*. They set up a temporary government with Brigham Young as governor. Church leaders filled other government offices. The settlers adopted a constitution and asked to be admitted to the Union. But Congress was engaged in a bitter debate over the question of slavery in the United States. This debate resulted in a series of acts called the *Compromise of 1850*. Part of the compromise established the Utah Territory, with Young as the first territorial governor. The territory extended far to the east and west of present-day Utah. See COMPROMISE OF 1850.

Between 1849 and 1895, Utah asked several times to be admitted to the Union. But Congress refused each time because of the Mormon practice of *polygamy* (one

IMPORTANT DATES IN UTAH

1776 Silvestre Velez de Escalante and Francisco Atanasio Domínguez made the first far-reaching exploration of the Utah region.

1824-1825 Jim Bridger probably was the first white man to see Great Salt Lake.

1847 Brigham Young and the first Mormon pioneers arrived in the Great Salt Lake region.

1848 The United States won the Utah area from Mexico.

1849 The Mormons created the State of Deseret, and adopted their first constitution.

1850 Congress established the Utah Territory.

1860-1861 The pony express crossed Utah.

1861 Telegraph lines met at Salt Lake City, providing the first transcontinental telegraph service.

1869 The first transcontinental railroad system was completed at Promontory.

1890 The Mormons in Utah prohibited polygamy.

1896 Utah became the 45th state on January 4.

1913 The U.S. Bureau of Reclamation completed the Strawberry River reservoir, the state's first large reclamation project.

1952 Rich uranium deposits were found near Moab.

1959 Utah became an important missile-producing state.

1964 Flaming Gorge and Glen Canyon dams were completed.

1967 Construction began on the Central Utah Project, a program to provide water for Utah's major growth areas.

1974 Oil companies invested millions of dollars to lease federally owned oil-shale land in Utah.

man having more than one wife). Actually, only a small number of the Mormon men had more than one wife. But Utah was refused statehood as long as the Mormons practiced polygamy.

President James Buchanan wanted to take control of the Utah Territory away from the Mormons. In 1857, he appointed Alfred Cumming of Georgia as territorial governor, in place of Brigham Young. Buchanan sent federal troops to enforce the appointment. This period became known as the *Utah*, or *Mormon, War*. The soldiers marched toward Utah, stopping along the way during the winter of 1857-1858. In September, 1857, a group of Utahans and Indians, nervously awaiting the federal troops, attacked a party of travelers passing through Utah. Most of the 140 travelers were murdered. Only a few small children were permitted to live. The incident became known as the *Mountain Meadows Massacre*. John D. Lee, who took part in the massacre, was later convicted and executed.

The federal troops, guided by Jim Bridger, arrived in Utah in the spring of 1858. They stayed three years. Bad feeling between the Mormons and the troops existed throughout the period, although little actual fighting occurred. Brigham Young was no longer territorial governor, but he remained the real leader of the Mormons. The troops left Utah when the Civil War began in 1861.

During the 1860's, Utah's boundaries were changed several times. Parts of the territory were given to Nevada, Colorado, and Wyoming. Congress established Utah's present boundaries in 1868.

The pony express began carrying mail on April 3, 1860. Pony express riders crossed Utah on their journeys from St. Joseph, Mo., to Sacramento, Calif. The pony express ended on Oct. 24, 1861. On that date, telegraph lines from Washington, D.C., and from San Francisco met in Salt Lake City. The nation's first transcontinental telegraph service started, providing a link between the eastern and western United States. The pony express was no longer needed.

In 1862, Congress passed a law forbidding polygamy. That same year, federal troops were again sent to Utah, under the command of Colonel Patrick E. Conner. Conner was interested in mining, and he encouraged his troops to prospect for minerals. In 1863, gold and silver were discovered in Bingham Canyon. Conner sent out word of the discovery. He hoped that a mining boom would bring a flood of non-Mormons into Utah and reduce Mormon control of the territory. But profits from Utah's minerals were small during the 1860's, mostly because of transportation problems. Few prospectors came to the territory. By the 1870's, however, many mining companies were operating in Utah.

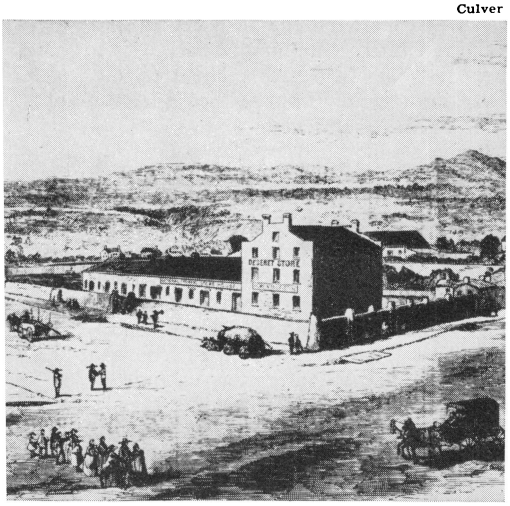
Plans for a transcontinental railroad had first been made during the 1850's. In 1863, the Central Pacific Railroad began building eastward from Sacramento, and the Union Pacific built westward, starting near Omaha, Neb. The two lines met at Promontory, Utah, on May 10, 1869. A railroad-building boom soon began in Utah.

During the 1880's, federal courts began enforcing federal laws against polygamy. Hundreds of Mormons were fined and sent to prison. A law passed in 1887 permitted the U.S. government to seize church property of the Mormons for use by public schools. In 1890, Wilford Woodruff, the church president, advised the Mormons to give up polygamy. In October of that year, the church officially prohibited polygamy.

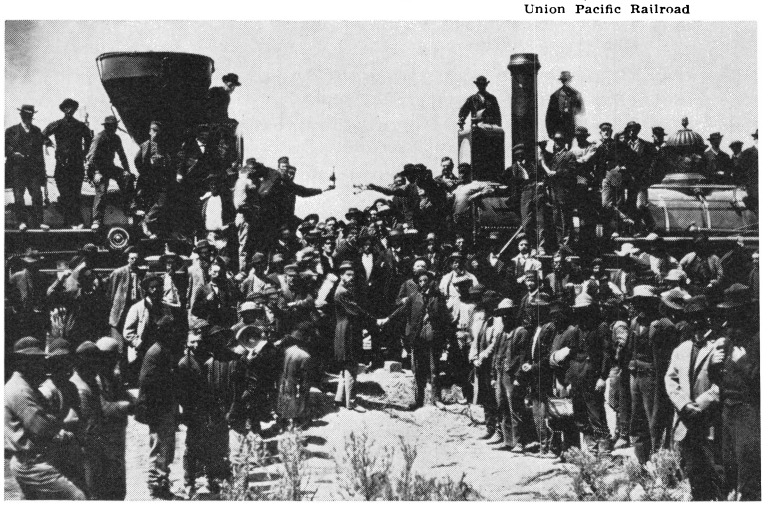
In 1895, Utah submitted a new constitution to Congress. This constitution outlawed polygamy and prevented control of the state by any church. Utah was admitted to the Union as the 45th state on Jan. 4, 1896. The people elected Heber M. Wells, a Republican, as their first governor.

The Early 1900's brought expansion of the railroad construction that had begun after the Civil War. The railroads opened new markets for Utah's farm and mining products. Utah farmers increased livestock operations, and beef cattle and sheep became important prod-

Deseret Store in Salt Lake City accepted grain from Mormons as payment for goods in the 1800's.
Culver



First Transcontinental U.S. Railroad was completed in 1869 in Promontory. Central Pacific and Union Pacific railroad officials drove in the last spike.
Union Pacific Railroad



ucts. Surface mining methods were introduced in Bingham Canyon in 1906. The state's copper production increased greatly. A huge federal irrigation project on the Strawberry River, completed in 1913, increased the amount of Utah's irrigated farmland.

Large smelters were built in the Salt Lake Valley during the early 1900's, and Utah's smelting industry grew. After the United States entered World War I in 1917, Utah mines supplied the Allies with large supplies of *nonferrous metals* (metals containing no iron).

Utah was hit hard by the Great Depression of the 1930's. The mining industry suffered. Farm prices dropped. Utah had one of the nation's highest percentages of unemployed workers. The state's economy improved in the late 1930's when the depression eased.

The Mid-1900's. Utah's manufacturing and mining industries prospered during World War II (1939-1945). After the war, the government increased its activities in Utah. Military installations established during the war were expanded. In the middle and late 1950's, missile plants were built in Brigham City, Ogden, and Salt Lake City. By 1959, the state had become a center of missile production.

During the 1950's and 1960's, Utah changed from an agricultural to an industrial state. The manufacture of steel products became an important industry. In 1952, a rich uranium deposit was discovered near Moab. Oil and gas fields were developed in eastern and southeastern Utah. In the early 1960's, the construction of Flaming Gorge Dam, Glen Canyon Dam, and many smaller dams brought further industrial growth.

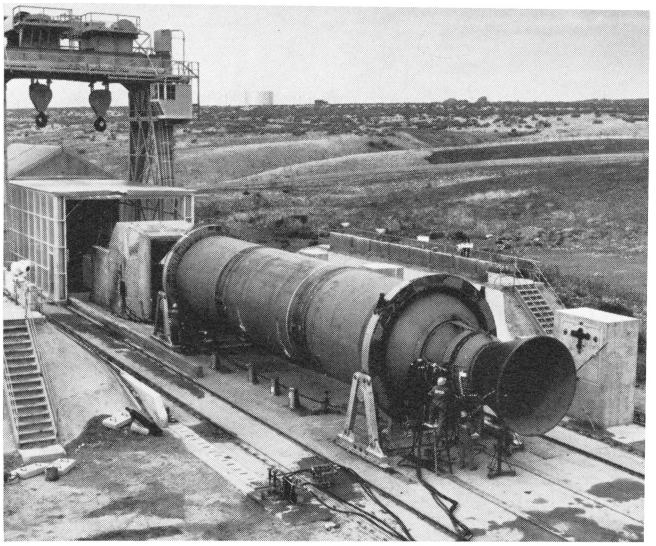
Tourism became an important industry in the state during the 1950's and 1960's. An increase in the number of urban residents led to demands for more recreational facilities, and development of outdoor recreation areas in the state boomed. New facilities included Canyonlands National Park. Ski resorts in the Wasatch Mountains attracted visitors from throughout the nation.

During the 1960's, the Utah economy suffered a series of setbacks. The need for missile parts produced in the state declined in 1963, and the value of Utah's missile industry fell. A slump in mineral prices caused the value of the state's mineral products to drop.

The cost of operating Utah's schools soared between the late 1940's and early 1960's. In 1963, Utah educators requested an additional $25½ million in state aid to education. The state legislature provided $11 million. Governor George D. Clyde then set up a commission to examine Utah's educational needs. In 1964, the commission urged that aid to education be increased by another $6 million. Clyde refused to approve the increase because he felt it would cripple the state's economy.

The National Education Association (NEA) urged teachers throughout the United States not to accept jobs in Utah until the problem was solved. Never before had U.S. educators organized a protest against an entire state. In 1965, the legislature increased school aid by $25½ million over a two-year period. The NEA then ended its protest.

Utah Today. The state relies heavily on the federal government, which owns and administers about 70 per cent of Utah's land. Most of the state's water comes from lakes and streams in national forests and is stored behind federally built dams. About 7 per cent of Utah's workers are employed by the federal government.



Thiokol Chemical Corporation

Testing Station for Large Rocket Nozzles operates in Brigham City. The giant motor uses solid fuel.

THE GOVERNORS OF UTAH

	Party	Term
1. Heber M. Wells	Republican	1896-1905
2. John C. Cutler	Republican	1905-1909
3. William Spry	Republican	1909-1917
4. Simon Bamberger	Democratic	1917-1921
5. Charles R. Mabey	Republican	1921-1925
6. George H. Dern	Democratic	1925-1933
7. Henry H. Blood	Democratic	1933-1941
8. Herbert B. Maw	Democratic	1941-1949
9. J. Bracken Lee	Republican	1949-1957
10. George D. Clyde	Republican	1957-1965
11. Calvin L. Rampton	Democratic	1965-

Only Alaska and Hawaii have a higher percentage.

Education costs remain a problem for Utah in the 1970's. Because of the Mormon emphasis on education, Utahans average more years of school than people in any other state. Utah also spends a greater percentage of its funds on education than almost every other state.

Utah is also concerned about environmental problems. For example, the state has a limited supply of water. Construction began on the Central Utah Project in 1967. This project will provide large amounts of water to the part of Utah that has a high rate of population and industrial growth. In 1968, nerve gas being tested in western Utah by the U.S. Army accidentally poisoned about 6,000 sheep. Utahans demanded an end to the testing and storing of such chemicals in the state. In 1969, the Utah legislature set up a statewide program to fight increasing air pollution.

Prospects for the development of Utah's huge oil-shale deposits appear bright. During the early 1970's, there was a nationwide oil shortage, and the price of oil rose sharply. The rising prices promised to make it profitable for oil companies to produce oil from shale rock in spite of the high processing costs. In 1974, several oil companies invested millions of dollars to lease federally owned oil-shale land in Utah. The oil shortage also led to increased coal production in the state. Utah faced the challenge of developing its industries while protecting the environment from pollution and other problems caused by industrial growth.

EVERETT L. COOLEY, ROBERT LAYTON, and WILLIAM B. SMART

UTAH/Study Aids

Related Articles in WORLD BOOK include:

BIOGRAPHIES

Bridger, James
Browning, John M.
Smith, Joseph F.
Smoot, Reed
Sutherland, George
Young, Brigham

CITIES

Brigham City
Logan
Ogden
Provo
Richfield
Saint George
Salt Lake City

HISTORY

Cliff Dwellers
Deseret
Guadalupe Hidalgo, Treaty of
Jefferson Territory
Mormons
Ute Indians
Western Frontier Life

NATIONAL PARKS AND MONUMENTS

Arches National Park
Bryce Canyon National Park
Canyonlands National Park
Capitol Reef National Park
Cedar Breaks National Monument
Dinosaur National Monument
Hovenweep National Monument
Natural Bridges National Monument
Rainbow Bridge National Monument
Timpanogos Cave National Monument
Zion National Park

PHYSICAL FEATURES

Colorado River
Great Basin
Great Salt Lake
Great Salt Lake Desert
Lake Powell
Rocky Mountains
Utah Lake
Wasatch Range

PRODUCTS

For Utah's rank among the states in production, see the following articles:

Cherry
Copper
Gold
Lead
Sheep
Silver
Wool

Outline

I. Government
- A. Constitution
- B. Executive
- C. Legislature
- D. Courts
- E. Local Government
- F. Taxation
- G. Politics

II. People

III. Education
- A. Schools
- B. Libraries
- C. Museums

IV. A Visitor's Guide
- A. Places to Visit
- B. Annual Events

V. The Land
- A. Land Regions
- B. Rivers and Lakes
- C. Deserts

VI. Climate

VII. Economy
- A. Natural Resources
- B. Manufacturing
- C. Mining
- D. Agriculture
- E. Electric Power
- F. Transportation
- G. Communication

VIII. History

Questions

Where in Utah is the nation's largest Swiss cheese factory?

What lake once covered most of present-day Utah? What two lakes are remnants of that body of water? How do they differ?

What historic event occurred at Promontory in 1869?

What event ended the pony express? How was Utah involved in this event?

Why did the Mormons come to Utah? Who was their leader?

What are some of Utah's manufactured products?

Where is the Sea Gull Monument? Why was it built?

What is Utah's most valuable mineral?

What two features of Utah's 1895 constitution helped the territory be admitted to the Union?

What is unusual about the drainage of the Great Basin and Range region of Utah?

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ELLSWORTH, S. GEORGE. *Utah's Heritage*. Peregrine Smith, 1972.

HUNTER, MILTON R. *The Utah Story*. Rev. ed. Milton R. Hunter (668 F Street, Salt Lake City, Utah 84103), 1965.

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UTAH, UNIVERSITY OF, is a state-controlled, coeducational university in Salt Lake City, Utah. The university has a college of letters and science, and professional schools of business, education, engineering, fine arts, law, medicine, mines, nursing, pharmacy, and social work. It also has a graduate school and an extension division. Courses lead to bachelor's, master's, and doctor's degrees.

The university was founded in 1850 as the University of Deseret. It received its present name in 1892. For the enrollment of the University of Utah, see UNIVERSITIES AND COLLEGES (table). JAMES CHIPMAN FLETCHER

UTAH LAKE is the largest fresh-water lake in Utah. The lake lies in a valley between mountain ranges near the town of Provo, and is about 30 miles (48 kilometers) south of Great Salt Lake. Utah Lake is about 8 miles (13 kilometers) wide, and 23 miles (37 kilometers) long. It covers an area of about 150 square miles (388 square kilometers), and lies at a height of about 4,505 feet (1,373 meters) above sea level. The lake gets its water from streams which dash down the slopes of the Wasatch Range. Utah Lake empties into the Jordan River. The river flows on through Salt Lake City and empties into Great Salt Lake. For location, see UTAH (physical map). A. R. MORTENSEN

UTAH STATE UNIVERSITY is a coeducational institution in Logan, Utah. It has a graduate school and colleges of agriculture; education; forest, range, and wildlife management; humanities and sciences; family life; business and social sciences; and engineering and technology. It also operates Snow College, a junior college in Ephraim. Utah State University was founded in 1888. For enrollment, see UNIVERSITIES AND COLLEGES (table). DARYL CHASE

UTAMARO KITAGAWA, *oo tah mah roh kih tah gah woh* (1753-1806), was a leading Japanese printmaker. He turned public taste in the direction of bold drawing, striking poses, and unusual color contrasts. His beautiful women or pairs of lovers are tall and graceful. He often showed them only from the waist up, and drew faces and hands with great elegance under masses of jet-black hair. Toward the end of his life, he turned for novelty to exaggerations and distortions, which some of his followers carried even further. Utamaro was born at Kawagoe, Japan. ALEXANDER C. SOPER

See also JAPANESE PRINT (picture).

UTE INDIANS, *yoot,* gave their name to the state of Utah. This western tribe lived in the mountains and plains along what is now the Colorado-Utah border and in northern New Mexico.

Before the coming of the white man, the Ute were hunters and seed-gatherers much like the Shoshoni (see INDIAN, AMERICAN [California-Intermountain Region]). During the summer months, they moved in small family groups to the mountain valleys in search of berries, fish, and game. During the cold, snowy winters, they left the mountains and followed the antelope, deer, and buffalo into the warmer plateau regions to the south.

When the Ute acquired horses from the Spaniards in the 1700's, they changed their way of life. They became expert horsemen and ranged over a much wider area than before, hunting buffalo. Family groups joined together to form marauding bands. They obtained horses by raiding Spanish settlements or nearby Indian tribes. Raiding and hunting led the Ute into warfare with powerful Plains tribes, including the Comanche, Kiowa, Cheyenne, and Arapaho. From them they copied such customs as the tepee, the sun dance, and the travois (see TRAVOIS). They also adopted the custom of using large defensive shields.

The government assigned reservations in Utah and Colorado to the Ute in the late 1800's. After several outbreaks, they settled down as farmers and cattlemen. The discovery of oil and minerals on their lands improved their economic condition. Many became skilled industrial workers. CHARLES E. DIBBLE

See also INDIAN WARS (The Southern Plains).

UTENSIL. See KITCHEN.

UTERUS. See MENSTRUATION; EMBRYO.

UTICA, *YOO tee kuh,* an ancient North African city, was the oldest Phoenician colony in the western Mediterranean Sea. It stood about midway between present day Tunis and Bizerte, Tunisia. According to legend, Utica was founded in 1101 B.C. But scholars now believe it was founded in the 700's B.C. Utica was an important seaport, but its site is now about 7 miles (11 kilometers) from the sea. Some ruins of the city remain.

At first, Utica and the neighboring colony of Carthage were almost equal in power. With Motya, a colony in western Sicily, they gave Phoenicia control of the Mediterranean passage to the Straits of Gibraltar, threatening Greek sea trade.

Carthage later became an independent power, and began to challenge Rome by the 300's B.C. Utica sided with Rome during the Third Punic War (149-146 B.C.), between Rome and Carthage. Rome won the war and made Utica capital of its new province of Africa. Utica was conquered by Arabs in the A.D. 600's. LOUIS L. ORLIN

UTICA, N.Y. (pop. 91,340), is an important commercial and industrial center in the Mohawk Valley along the New York State Barge Canal System. It lies about 90 miles (140 kilometers) northwest of Albany. The city lies in a rich agricultural and dairy region.

Utica covers an area of about 16 square miles (41 square kilometers). With Rome, N.Y., it forms a metropolitan area of 340,670 persons.

Industry and Trade. During the late 1800's and early 1900's, Utica ranked first among the cities of New York in the production of cotton cloth. After World War II, when many textile companies began to move to southern states, Utica factories started to produce a variety of tools, machines, and manufactured articles. Important products include heating, ventilating, refrigerating, and air-conditioning equipment; electronic tools and products; pneumatic tools; paper products; air compressors; and men's and boys' clothing. Utica is also a trading center for farmers of the Mohawk Valley.

Utica lies on the only water-level pass through the Appalachian Mountains. An airport, and railroad, bus, and truck lines serve Utica. The city also is a major New York State Barge Canal System terminal.

History. A king's grant to William Cosby and his associates in 1734 included the site of Utica. Fort Schuyler was built on the site during the French and Indian War (1754-1763). After the Revolutionary War, many persons from New England and the lower Mohawk Valley settled there. Utica was incorporated as a village in 1798. The name (from that of an ancient North African town) was drawn from suggestions placed in a hat. Utica was chartered as a city in 1832. It has a mayor-council form of government. WILLIAM E. YOUNG

UTICA COLLEGE. See UNIVERSITIES AND COLLEGES (table [Syracuse University]).

UTILITARIANISM, *yoo TIL uh TAIR ee un iz'm,* is the doctrine that the goal of life is "the greatest happiness of the greatest number." Whatever brings about this happiness has "utility." Anything that obstructs such happiness is useless. Utilitarians hold that the most definite mark of happiness is pleasure. Jeremy Bentham, "the father of the Utilitarians," first developed this idea in England.

The name *Utilitarianism* was not used until John Stuart Mill, a disciple of Bentham, formed the Utilitarian Society in 1823. The society became a great center of liberal thought and helped to bring about many reforms. H. M. KALLEN

See also BENTHAM, JEREMY; MILL (family).

UTILITY, PUBLIC. See PUBLIC UTILITY.

UTOPIA, *yoo TOH pee uh,* is the name commonly given to an imaginary land where everything is supposed to be perfect. The name *utopia* comes from the Greek words *ou* and *topos,* meaning *no place.* The name refers particularly to a type of society with ideal economic and social conditions. People often apply the adjective *utopian* to plans of reform that they consider to be impractical and visionary.

The word *utopia* was used as the title of a famous book by Saint Thomas More. *Utopia* was first published in Latin in 1516 and was translated into English in 1551. It is partly in the form of a dialogue. The book gives More's views on the ideal government. But, like

most writings on utopias, it also criticizes social and economic conditions of More's times.

More's *Utopia* is the report of a Portuguese sailor Raphael Hythlodaye. The sailor has made three voyages to America with the explorer Amerigo Vespucci, and tells of his travels through wild and unexplored places. The greatest wonder is the island of Utopia, where all men are equal, prosperous, educated, and wise.

Several other books have presented an imaginary ideal state of society. One of the first books describing a utopia was Plato's *Republic*, written about 375 B.C. More recent utopias are described in Samuel Butler's *Erewhon*, which almost spells *nowhere* backwards (1872); Edward Bellamy's *Looking Backward* (1888); and H. G. Wells' *A Modern Utopia* (1905). GEORGE A. WICKES

See also BELLAMY, EDWARD; MORE, SAINT THOMAS; PLATO; WELLS, H. G.

UTRECHT, *YOO trekt* (pop. 274,388; met. area 441,-459), a Dutch city, lies on the Rhine River, about 22 miles (35 kilometers) southeast of Amsterdam (see NETHERLANDS [map]). Utrecht is called the *City of Spires and Bridges* because of its many churches and bridges. A triple avenue of trees, the *Maliebaan*, is a popular sight in Utrecht. Industries include sawmills, machine shops, breweries, carpet works, and factories that make velvets, cottons, linens, and musical instruments.

Much Dutch history centers about this interesting old city. In 1579, the seven northern Protestant provinces united in Utrecht. The nation of The Netherlands grew out of this union. A treaty that helped end the War of the Spanish Succession was signed at Utrecht in 1713 (see UTRECHT, PEACE OF). BENJAMIN HUNNINGHER

UTRECHT, *YOO trekt*, **PEACE OF,** was one of the great international peace settlements of history. The conference opened in Utrecht, Holland, in 1712, at the end of the War of the Spanish Succession. In America, this was known as Queen Anne's War, one of the French and Indian Wars. Representatives from all major European nations met to discuss peace terms. They signed agreements at Utrecht in 1713.

The Peace of Utrecht made many changes in the map of Europe, and tried to establish a balance of power. It also helped to increase Great Britain's colonial and commercial power. The treaty recognized the French Duke of Anjou as King of Spain, but France agreed that Spain and France would never be united under one ruler. Great Britain acquired Gibraltar and the island of Minorca from Spain. Spain also gave Great Britain the *assiento* (contract) for supplying the Spanish colonies with African slaves. The Duke of Savoy took control of the Spanish island of Sicily. Austria received Milan, Naples, Sardinia, and the Catholic Netherlands from Spain. Holland, in the "barrier treaties," received the right to arm frontier towns against French aggression.

In America, France ceded Nova Scotia, Newfoundland, and the Hudson Bay Territory to Great Britain, but retained New France (Quebec). ROBERT G. L. WAITE

See also FRENCH AND INDIAN WARS (Queen Anne's War); SUCCESSION WARS (Spanish Succession).

UTRILLO, *oo TREE loh*, **MAURICE** (1883-1955), was a French artist known for his paintings of Paris street scenes. His favorite subject was the Montmartre district, with its steep streets and picturesque windmills. Most of Utrillo's paintings have a melancholy feeling. The streets are empty, or a few lonely figures wander through them. New-fallen snow and leaden skies give a gloomy air to many scenes. He increased the gloominess by the use of deep perspectives. From 1908 to 1914, Utrillo used white and off-white colors with soft, warm ones. His later paintings have brighter colors.

Utrillo was born in Paris. His mother was Suzanne Valadon, a well-known painter and artists' model. She introduced him to painting, but he was essentially self-taught. Utrillo painted his scenes from memory or used picture postcards as aids. WILLARD E. MISFELDT

Sacré Coeur de Montmartre (1937), a painting on paper mounted on canvas; Indianapolis Museum of Art, Indianapolis, Ind., Delavan Smith Fund

A Typical Utrillo Painting portrays lonely figures on the narrow, twisting streets of Montmartre, a district of Paris.

UVULA. See PALATE.

UZBEKISTAN, *ooz behk ih STAN*, is a region that makes up the Uzbek Soviet Socialist Republic, one of the 15 republics of the Soviet Union. The Uzbek republic is the third most thickly populated Soviet state in northern Asia. It lies in the foothills of the Tien Shan and Pamir mountains in Turkestan, and extends northwest to the Aral Sea (see RUSSIA [map]). The state covers 173,592 square miles (449,601 square kilometers) and has 12,305,000 persons. The region produces large quantities of almonds, apricots, cotton, and raisins and other dried fruit. Stock and sheep raising and horse breeding are important activities. Mineral resources include natural gas, petroleum, and sulfur. The state also has electric power stations and steel mills. Tashkent, the largest city in the Asian part of the Soviet Union, is the capital of the Uzbek republic. GEORGE KISH

See also SAMARKAND; TASHKENT; TURKESTAN.

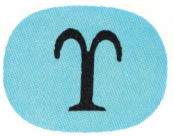
Vv is the 22nd letter of our alphabet. It came from a letter used by the Semites, who once lived in Syria and Palestine. They called the letter *waw*, their word for *hook*. They wrote the letter with a symbol borrowed from an Egyptian *hieroglyphic*, or picture symbol. The Greeks borrowed the letter from the Phoenicians and gave it a *Y*-shape. The Romans, when they adopted it, dropped the vertical stroke. They used it for the vowel sound, *u*, and the consonant sound, *v*. About A.D. 900, people began to write *v* at the beginning of a word and *u* in the middle. During the Renaissance, people began using *v* for the consonant and *u* for the vowel. But the change was not final for several hundred years. See ALPHABET.

Uses. *V* or *v* is about the 21st most frequently used letter in books, newspapers, and other material printed in English. *V* is the Roman numeral for five. As an abbreviation, *V* may stand for *veteran* or *volunteer*. It is the abbreviation for *verb* in grammars and dictionaries. In music, it stands for *violin* or *voice*. It may mean *various*, *volt*, *volume*, or *versus*. In chemistry, *V* is the symbol for the element *vanadium*.

Pronunciation. A person pronounces *v* by placing his lower lip on his upper teeth, closing his *velum*, or soft palate, and forcing his breath through his teeth and lips, vibrating his vocal cords. This sound may be spelled *ph*, as in *Stephen*. In German, it may have a sound like that of English *f*. In Spanish it may have a *b* sound. See PRONUNCIATION. I. J. GELB and J. M. WELLS

The 22nd letter took its shape from an ancient Egyptian symbol for a supporting pole. The Romans gave it its present shape, but used it for both U and V sounds.

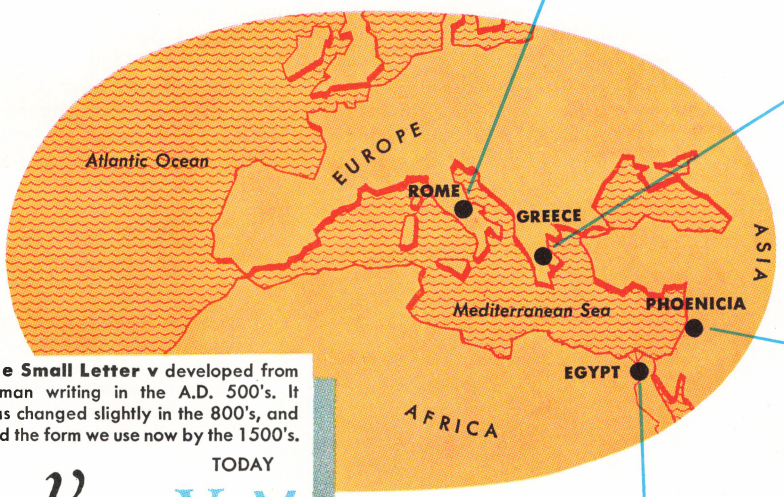
The Romans, about A.D. **114,** gave the letter its capital **form.**



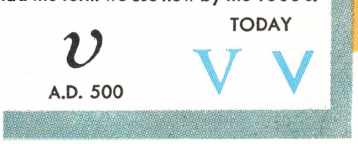
The Greeks, about **600 B.C.,** called their letter ***upsilon.***

The Phoenicians, about **1000** B.C., used a symbol **of a hook.**

The Egyptians, about 3000 **B.C.,** used a symbol of a supporting **pole.**



The Small Letter v developed from Roman writing in the A.D. 500's. It was changed slightly in the 800's, and had the form we use now by the 1500's.



V-1, V-2. See GUIDED MISSILE (The First Guided Missiles); ROCKET (Rockets of the Early 1900's).

V-E DAY, or VICTORY IN EUROPE DAY, was officially proclaimed by President Harry S. Truman on Tuesday, May 8, 1945. It marked the surrender of the German armed forces and the end of the fighting against Germany.

The German surrender was signed at the headquarters of General Dwight D. Eisenhower in Reims, France, at 2:41 A.M. on May 7. Colonel General Alfred Jodl, chief of staff of the German armed forces, signed for Germany. GEORGE E. MOWRY

See also WORLD WAR II (Victory in Europe).

V-J DAY, or VICTORY OVER JAPAN DAY, marked the end of World War II. At 7 P.M. on August 14, 1945, President Harry S. Truman announced that Japan had agreed to surrender unconditionally. Japan had been trying to end the war, and surrender rumors had raced through the United States for the four days before August 14.

September 2, 1945, has since been declared the official V-J Day. On that day, the Japanese signed the terms of surrender aboard the battleship U.S.S. *Missouri* in Tokyo Bay. GEORGE E. MOWRY

See also WORLD WAR II (Victory in the Pacific).

V-PARTICLE is a name that was originally given to nuclear particles that produced V-shaped tracks when they passed through a *cloud chamber* (see WILSON CLOUD CHAMBER). Scientists no longer use the term *V-particle*. They have found that V-shaped tracks are produced by *hyperons* and *K-mesons*. Scientists call any phenomenon that produces a V-shaped track a *V-event*. See also ATOM (Inside the Atom).

VAAL RIVER, *vahl*, is the largest branch of the Orange River in South Africa. It rises in the Drakensberg mountains in southeastern Transvaal. For 750 miles (1,210 kilometers), the Vaal is the boundary between Transvaal and the Orange Free State. The Vaal joins the Orange River in Cape Province. Dams on the Vaal supply water for Johannesburg. Only small boats can sail on the Vaal, because of rapids and periods of low water. WILLIAM A. HANCE

VACA, ÁLVAR NÚÑEZ CABEZA DE. See CABEZA DE VACA, ÁLVAR NÚÑEZ.

VACATION. The human body cannot operate at full efficiency without frequent rest. Doctors have long recognized that many illnesses of the body and nervous system can best be cured by a rest from normal, everyday activity. A change in routine that helps restore people's bodies, minds, and spirits is called a *vacation*.

To young persons, a vacation usually means the summer months when they do not have to attend school. For the average adult, a vacation is a definite period of time when he does not have to work at his regular job. The custom of giving employees a regular vacation with pay began fairly recently with the development of factories, large stores, and large business offices. During the 1800's, employers discovered employees worked more efficiently after a vacation. Many labor union contracts require that employees be given annual vacations.

Things to do on a vacation are almost countless. Present-day transportation has made it possible for vacationers to travel to almost any place they choose. This has given rise to the tourist industry.

There are many interesting places to go in the United States and Canada. For descriptions, see the article NATIONAL PARK SYSTEM and the Places to Visit section and Annual Events section of the articles on each of the states and provinces. BERNARD S. MASON

See also CAMPING; DUDE RANCH; HOBBY; SAFETY (Recreation); YOUTH HOSTEL.

VACCINATION, *VACK sih NAY shun*, is the introduction of dead or weakened viruses or bacteria, or their *toxins* (poisons) into the body to develop resistance to disease. The material introduced is called a *vaccine*. The vaccine causes the body to manufacture substances called *antibodies* which fight the effects of bacteria, toxins, and viruses. Vaccines must be strong enough to cause the body to develop resistance, but weak enough so they will not infect the body or cause serious illness.

Effective vaccines have been developed against cholera, diphtheria, German measles, influenza, measles, mumps, whooping cough, bubonic plague, poliomyelitis, rabies, Rocky Mountain spotted fever, smallpox, *tetanus* (lockjaw), typhoid and paratyphoid, typhus, and yellow fever. Most vaccines are injected into the body, though Sabin polio vaccine is taken by mouth.

Some vaccines provide protection from infection for a long period of time. Other vaccines are effective for shorter periods of time. "Booster" injections

Wide World

Doctors Vaccinate Babies against smallpox, polio, and other dread diseases. The vaccines, prepared from dead or weakened viruses, help the body build resistance.

of some vaccines are necessary at regular intervals.

Certain vaccines are given routinely to almost every person in the United States. Others, such as those for plague, cholera, and yellow fever, are given only to persons traveling to areas where the disease exists. Vaccines for some rare diseases are given only to persons who risk exposure to the disease. Rabies vaccine is given to persons who have been bitten by an animal that is suspected of carrying that disease.

The word *vaccination* comes from the Latin word, *vacca*, meaning cow. The term originally referred to the injection of cowpox virus to prevent smallpox.

Edward Jenner introduced the vaccination as a preventive measure against smallpox in 1796. The success of the smallpox vaccine led to the search for vaccines to prevent other serious diseases. SOLOMON GARB

Related Articles in WORLD BOOK include:

BCG	Jenner, Edward	Salk, Jonas Edward
Immunity	Poliomyelitis	Smallpox
Inoculation		

VACUUM, *VACK yoo um*, is a term taken from the Latin word *vacuus*, which means *empty*. A vacuum is a space which has no matter in it. Strictly speaking, there is no such thing as a vacuum, because all space as we know it contains some matter. In practice, we speak of a vacuum as a space from which most of the air or other gas has been taken, and in which the pressure is extremely low. But this is only a *partial vacuum*.

In the air we breathe, there are about 400 billion billion molecules of gas per cubic inch (25 billion billion per cubic centimeter). Man can create partial vacuums in which there are only a few million molecules per cubic inch (16 cubic centimeters). But no one has ever created an absolute vacuum—that is, taken all the air out of an enclosed space. We cannot do this, even with the most powerful air pump or by chemical means. Among the most nearly complete vacuums that have been attained is one in which the pressure of the gas is about one ten thousand-millionth of the normal pressure of the air. Scientists speak of *high* or *low partial vacuums*, depending upon how completely the air or any other gas has been taken out of an enclosed space. Any space in which the pressure is about one thousandth of that of the atmosphere is usually called a vacuum.

The important thing about a vacuum is that it is usually a useful emptiness. For example, if we create a partial vacuum in any space, water or any other fluid may enter into it. We make use of this principle in drinking lemonade through a straw. We do not pull the liquid up through the straw. Instead, by sucking on one end of it, we take out some of the air that is in the straw. The air outside exerts pressure on the liquid and forces it up and out through the partial vacuum in the straw. The pump used to pump water into our homes, the air pumps which inflate automobile tires, and the gas intake of an automobile motor all make use of this principle. The vacuum cleaner is another example of the usefulness of a vacuum. In a vacuum bottle, a vacuum prevents heat from entering or leaving by conduction or convection. Most electronic tubes contain a high vacuum. This keeps the air or gas inside from being affected by the passage of electrons across the tube.

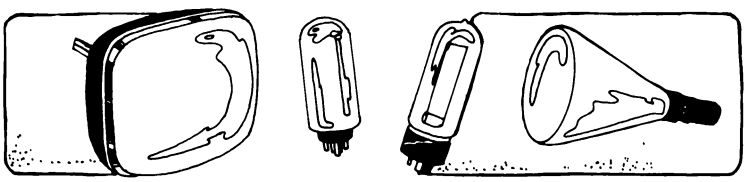
In the sugar-refining industry, a vacuum pan is used. This evaporates liquids at a temperature lower than the ordinary boiling point. The vacuum pan is made up of a closed vessel heated by a steam jacket. An air pump holds the steam in the air constantly from the surface of the liquid inside. The liquid boils and evaporates without danger of burning.

In some vacuum tubes in use today, as much air as possible is taken out of the tubes by means of an air pump. Then a chemical called a "getter" is placed in-

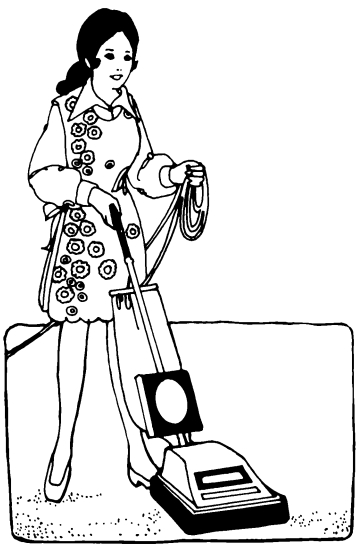
PUTTING A VACUUM TO WORK

Sucking on a straw creates a partial vacuum in it. Air pressure on the liquid in the glass forces the liquid up the straw and into the mouth.

A partial vacuum in the lower part of a coffee maker pulls hot water from the upper part.



Television picture tubes, cathode-ray tubes for oscilloscopes, and other kinds of electronic tubes cannot work unless air is pumped from them. The partial vacuum inside the tube keeps the hot filament from burning up and allows electrons to flow.



In a vacuum cleaner, air flows into a partial vacuum and carries dust and dirt into the collection bag of the machine.

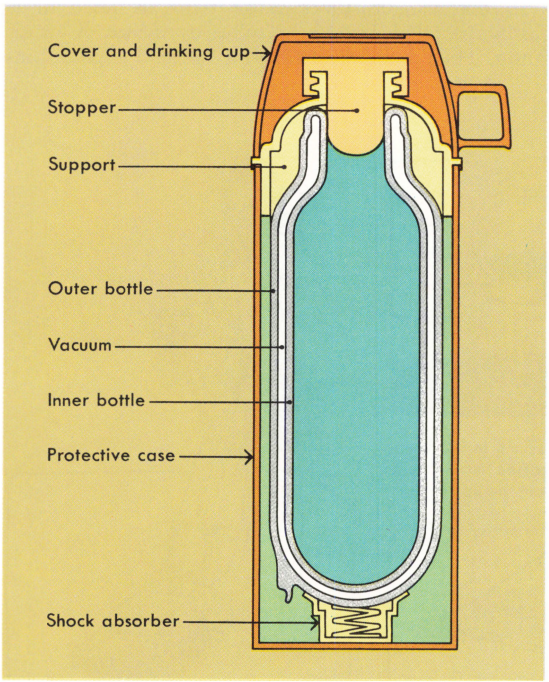
side the tube. This increases the vacuum by combining with a large part of the remaining air inside the tube. The chemical coats the inside surface of the vacuum tube.

One other important characteristic of a vacuum is the fact that sound cannot cross a high vacuum. This can be seen if we set an alarm clock ringing inside a bell jar in the laboratory. As the air inside the bell jar is pumped out, the sound of the clock's bell gradually grows less and less until such a high partial vacuum is reached that the ringing bell can be heard no more. MARCEL SCHEIN

See also PUMP; VACUUM BOTTLE; VACUUM CLEANER; VACUUM TUBE.

VACUUM BOTTLE. We can keep liquids hot or cold for as long as 24 hours in vacuum bottles, sometimes called *Thermos* bottles. The vacuum bottle is designed to reduce greatly the exchange of heat between the inside of the bottle and the outside. The bottle is designed to limit the transfer of heat that may take place through (1) conduction, (2) convection, and (3) radiation. See HEAT (How Heat Travels).

The vacuum bottle has an inner container, which is made of glass. This inner container is a bottle within a bottle, sealed at the lips by melting the glass edges. Air is removed from the space between the two bottles to produce a near vacuum. Glass is a poor *conductor* of heat but a vacuum conducts heat even less. The vacuum between the bottles slows down the transfer of heat by *convection*. In order to reduce the transfer of heat by *radiation*, the facing surfaces of the glass bottles are coated with a silvery solution of aluminum which reflects heat. Cork is used for the stopper and for the pads which hold the bottles in place in their outer container because cork is a poor *conductor* of heat. The outer container is made of metal or of molded plastic. The bottles are held in place within the container by a rubber collar at the top of the container. A spring at the bottom of the bottle acts as a shock absorber.



WORLD BOOK diagram

A Vacuum Bottle is actually two bottles in one, as shown in the diagram above. A vacuum in the space between the inner and outer bottles prevents heat from passing through the bottle.

The first vacuum-insulated container was the Dewar flask. Sir James Dewar invented it in 1885 as a means of keeping heat away from liquid gases with which he was experimenting. He sold it under the trade name of *Thermos*, meaning *heat*.

Vacuum containers range in capacity from 2 ounces (59 milliliters) to 15 gallons (57 liters). These containers are carried on exploring and scientific expeditions, and on transport planes. They are also used in the handling of certain chemicals and drugs, and for various scientific experimental purposes. JOHN T. R. NICKERSON

VACUUM CLEANER is a machine for removing dirt from floor coverings, upholstery, tapestries, and various other household furnishings. Several inventors produced and patented designs for vacuum cleaners around 1900. Vacuum cleaners are now used in most households.

The vacuum cleaner does its work with a suction fan or an air exhausting fan. The fan or pump makes a partial *vacuum* (space where there is little air) within the cleaner. The cleaner gets its name from this. Outside air always tries to fill a vacuum. The outside air rushing into the vacuum picks up dirt and waste and carries it to the bag attached to the cleaner.

The two basic types of vacuum cleaners are rotating cylinder cleaners and straight suction cleaners. The *rotating cylinder cleaner* has either a stiff brush or a set of agitator bars that helps to loosen dirt in a rug. The vacuum in the cleaner then pulls the dirt into an upright bag attached to the handle of the cleaner. The *straight suction cleaner* removes dirt by suction only. It is also called a tank or cannister cleaner. The dirt is carried into the cleaner through a flexible tube attached to the cleaner's top or side. In some models, the dirt is deposited in a tank of water to avoid raising dust.

The *hand* vacuum cleaner is a smaller machine. It is light enough to carry and is used for dusting and cleaning clothing, upholstered furniture, curtains, draperies, rugs, and carpets. RAYMOND F. YATES

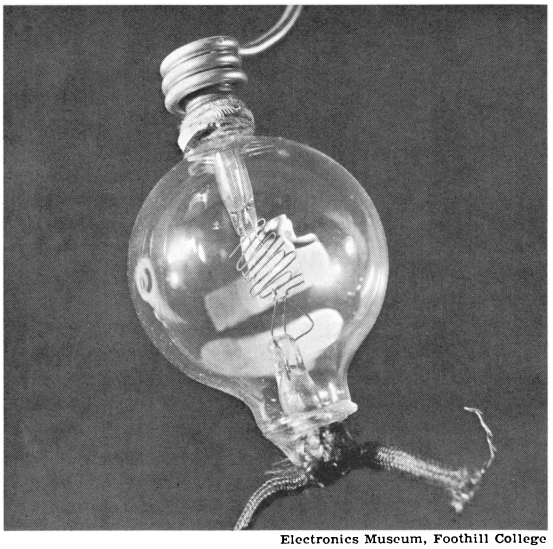
VACUUM GAUGE. See GAUGE.

VACUUM PUMP. See PUMP.

VACUUM TUBE is a device once widely used in such electronic equipment as radios, television sets, and computers. Vacuum tubes control the electric currents, called *electronic signals*, that are necessary to the operation of such equipment. The tubes help to create these signals, strengthen them, combine them, or separate them from one another.

The outer part of a vacuum tube consists of a tube-like glass or metal shell. Inside the shell are specially designed wires and small metal plates that control the electronic signals. The vacuum tube gets its name from the fact that almost all the air must be removed from the tube for it to work. A *partial vacuum* is created inside the tube by pumping out as much air as possible.

Vacuum tubes played an important part in the development of the science of electronics. From the 1920's through the 1950's, all electronic equipment used vacuum tubes. Since that time, the vacuum tube has been replaced in most kinds of electronic equipment by



Electronics Museum, Foothill College

The Audion was the first vacuum tube that could strengthen an electronic signal. It made possible the development of electronics.

a newer device called the *transistor*. Transistors do the same jobs as vacuum tubes but are smaller and more reliable (see TRANSISTOR). Certain electronic equipment still uses various types of vacuum tubes. For example, the screen of a television set is one end of a large vacuum tube. See ELECTRONICS (Devices and Circuits).

How a Vacuum Tube Works. The outer part of most common vacuum tubes is a glass or metal container called an *envelope* or *bulb*. The envelope encloses two or more metal parts called *electrodes*. The electrodes create and control a flow of electrons within the tube. This flow of electrons corresponds to the electronic signal being controlled by the tube. The electrodes are connected to wires that pass through the *base* (bottom) of the envelope. Electronic signals enter and leave the vacuum tube by means of these wires.

Two basic electrodes in a vacuum tube are the *emitter*, or *cathode*, and the *collector*, or *anode*. The emitter gives off electrons. These electrons flow to the collector, which surrounds the emitter. The emitter has a coating that gives off electrons when it gets hot. Close to the emitter is a *filament* (glowing wire) much like the filament of a light bulb. Electricity from outside the tube flows through the filament and heats it. The filament heats the emitter, causing it to give off electrons.

The emitter usually has a negative electric charge and the collector usually has a positive charge. The electrodes get their charges from a battery or other source of direct current. The emitter is connected to the source's negative terminal and the collector to the positive terminal.

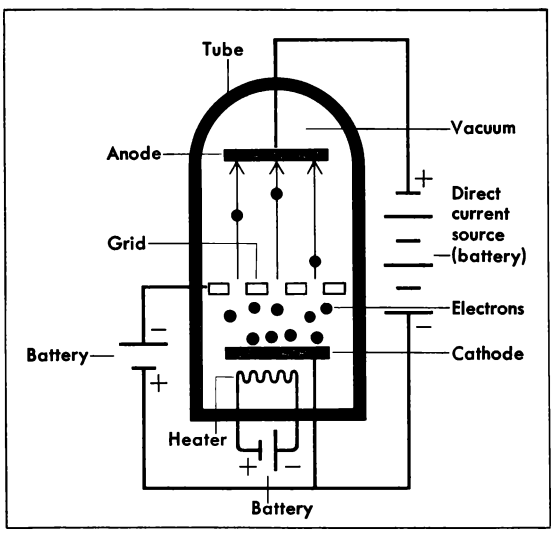
The negative charge on the emitter helps to push away the electrons produced by the emitter. This happens because electrons themselves have a negative charge, and two negative charges—or two positive charges—always push away from each other. But a negative and a positive charge always attract each other. Thus, the positive collector attracts the negative electrons. In this way, a current of electrons flows from the emitter to the collector.

Another basic vacuum tube electrode is the *grid*. It consists of a wire mesh located between the emitter and the collector. The grid controls the amount of electrons flowing through the tube. For example, a strong negative charge on the grid prevents many of the electrons from reaching the collector. If the negative charge on the grid becomes weaker, more electrons get past the grid and reach the collector. The strength of the charge on the grid corresponds to the strength of the electronic signal entering the tube.

A vacuum tube may have several other parts between the emitter and collector. It may also have charged metal plates that can "bend" a stream of electrons created in the tube. Magnets outside the tube can also bend the stream of electrons.

Kinds of Vacuum Tubes. There are many hundreds of vacuum tubes having various sizes and functions. But electrical engineers classify all tubes into a few basic types. Receiving tubes, the kind once widely used in radio and television receiving sets, are classified by the number of electrodes they have. Receiving tubes include (1) *diodes* (two-electrode tubes), (2) *triodes* (three-electrode tubes), and (3) multielectrode tubes. Other types of tubes include (1) cathode-ray tubes, (2) microwave tubes, and (3) gas-filled tubes.

Diodes have only an emitter and a collector. These tubes are used chiefly as *rectifiers*. A rectifier changes alternating current into direct current. An alternating current is one that keeps reversing its direction of flow. An electrode connected to a source of alternating current gets a charge that constantly changes from positive to negative and back again. If an alternating current is sent to a diode, the tube will pass the current only when the emitter has a negative charge. This happens



WORLD BOOK diagram

A Triode Vacuum Tube creates and controls a flow of electrons in a vacuum. The heater causes electrons to leave the cathode. A source of direct current connected to the tube pulls these electrons toward the anode. Voltage from a battery connected to the grid controls the number of electrons that reach the anode.

only when the current is flowing in one direction. Thus, the current leaving the tube is direct current.

Diodes were used in receiving sets as rectifiers and also as *detectors*. A detector changes the weak alternating current of the radio waves into direct current, from which the receiver produces a sound or picture. See ELECTRONICS (Rectification).

Triodes have a grid, as well as an emitter and a collector. The triode works as an *amplifier* (strengthener) of weak signals. A weak signal connected to the grid controls the much larger current flowing from the emitter to the collector. The large current thus becomes a stronger copy of the signal on the grid. A triode can also produce an alternating current of its own without using an outside signal. When the triode operates in this way, it is called an *oscillator*. See ELECTRONICS (Amplification; Oscillation).

Multielectrode tubes have more than one grid between the emitter and collector. Two important multielectrode tubes are the *tetrode* and *pentode*. A tetrode contains two grids—the basic one and a second grid called the *screen*. The screen prevents the tube from producing unwanted oscillations. A pentode has a third grid, called the *suppressor*. The suppressor improves the tube's amplifying power. Other multielectrode tubes have even more grids, but such tubes have limited use.

Cathode-ray tubes (CRT's) are used in electronic equipment to display pictures or other information. The picture tube of a television set is a CRT. In a radar set, a CRT shows tiny spots of light that locate the position of ships or airplanes. A CRT in an electronic instrument called an *oscilloscope* may display wavy-line "pictures" of electronic signals.

All CRT's work in basically the same way. The tube has a round or rectangular screen at one end. The tube tapers from the screen to a narrow neck at the opposite end. In the neck, there is a special type of emitter, called an *electron gun*. The electron gun "shoots" a beam of electrons toward the screen. Wherever the beam strikes the screen, it causes a special coating on the screen to glow. Electrically charged metal plates inside the CRT, or electromagnets outside the CRT, move the beam across the entire screen. The beam thus "paints" a picture on the screen with spots of light. See TELEVISION (The Picture Tube).

Microwave tubes produce or control radio waves of extremely high frequencies. Radar sets, long distance telephone and television communication systems, and microwave cooking ovens use such waves. Three types of microwave tubes are *klystrons*, *magnetrons*, and the *traveling-wave* tube.

Gas-filled tubes contain a small amount of such gases as argon, mercury vapor, and neon. These gases increase the amount of current that can flow through a tube. The atoms of gas become *ionized* by losing some of their electrons and thus becoming positively charged. The ionized atoms can carry much more electrical current than would otherwise flow through the tube. A typical gas-filled tube is the *thyratron*.

Development of the Vacuum Tube. Electrical experimenters began working with devices that resembled vacuum tubes during the mid-1800's. These devices were glass tubes with the air partially removed. The experimenters noticed a glow around the tubes, as well as other unusual effects, when electricity flowed through the tubes. See ELECTRONICS (Early Experiments).

The American inventor Thomas A. Edison invented the first electronic vacuum tube. But he did not realize the importance of his invention. In the early 1880's, Edison sealed an extra electrode into one of his electric lights. When the light was on, Edison found that a current flowed from the filament to the extra electrode. This phenomenon became known as the *Edison effect*. Edison failed to make any use of his discovery, which was actually a diode vacuum tube.

A British scientist, John Ambrose Fleming, experimented with the Edison effect. His experiments led him to develop a diode in 1904 to detect "wireless" radio signals. Fleming's *valve*, as he called his device, was the first practical radio tube.

In 1906, the American inventor Lee De Forest patented a two-electrode tube much like the Fleming valve. De Forest called his tube an *audion*. In 1907, De Forest patented an audion with a zigzag wire between the other two electrodes. This tube was the first triode.

In 1912, Harold D. Arnold, an American physicist, began experimenting with the audion. He changed its internal construction and removed as much air as possible to create a partial vacuum in the tube. In 1914, De Forest's audion worked successfully as an amplifier on a long-distance telephone line. Beginning in 1912, several inventors contributed to the development of the audion as an oscillator. They included De Forest and the American radio pioneer Edwin H. Armstrong. During World War I (1914-1918), Walter Schottky, a German physicist, invented an experimental four-element tube. From this tube, Albert W. Hull, an American engineer, developed a practical tetrode tube in 1924. A Dutch engineer, Benjamin D. H. Tellegen, invented the pentode in 1926.

Two vacuum tubes that represented significant steps in the development of television were invented in 1923. Vladimir K. Zworykin, a Russian-born American scientist, made the *iconoscope*—the first successful television camera tube. That same year, Zworykin built a workable television picture tube, the *kinescope*. His tubes were forms of the cathode-ray tube.

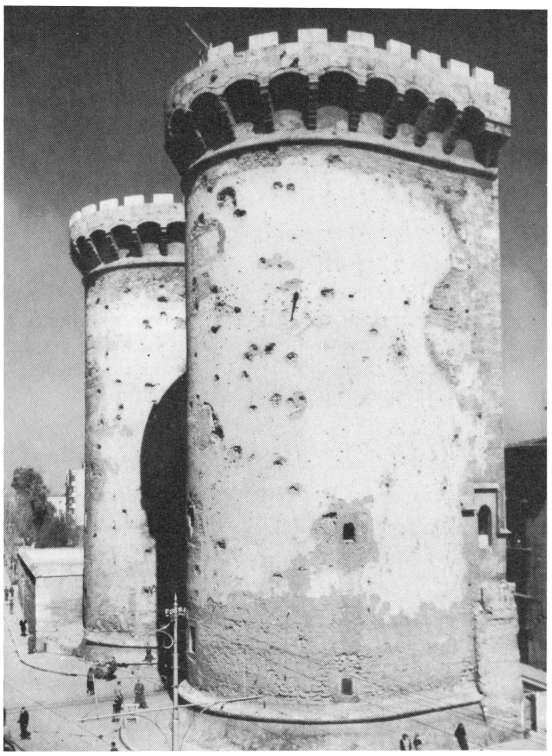
Electrical engineers turned their attention away from vacuum tubes after the transistor and similar devices were developed in the early 1950's. In the future, transistor devices are expected to replace all but a few vacuum tubes. BERNARD S. FINN

See also ELECTRONICS with its list of *Related Articles*.

VADUZ, *VAH doots* (pop. 3,957), is the capital of the principality of Liechtenstein. The city lies in an Alpine valley, in the shadow of high mountains (see LIECHTENSTEIN [map]). The major industry is cotton manufacturing. Vaduz was founded early in the Middle Ages, and many of the original buildings are still standing. The castle of the princes of Liechtenstein stands on a mountain high above the city. GEORGE KISH

VAGABOND. See VAGRANCY.

VAGRANCY, *VAY gruhn see*. A person who wanders from place to place, and who lives in idleness and without any settled home, is called a *vagrant*, or *vagabond*. Most states of the Union have laws against vagrancy,



Authenticated News

The *Torres de Cuarte* in Valencia, Spain, built in the 1400's, once served as a main fortified entrance to the city.

based on the idea that a vagrant has "no visible means of support" and may become a public charge. A person arrested for vagrancy may be sentenced to a term in jail. Law enforcement officers often arrest beggars and criminals as vagrants. FRED E. INBAU

VAISYA. See CASTE.

VALDEZ GLACIER. See GLACIER (Famous Glaciers).

VALDIVIA, PEDRO DE. See CHILE (History).

VALDOSTA STATE COLLEGE. See UNIVERSITIES AND COLLEGES (table).

VALE OF KASHMIR. See KASHMIR.

VALEDICTORIAN. See GRADUATION.

VALENCE, *VAY lence*, is a number that indicates the ability of a chemical element to combine with other elements. In the past, valence had several slightly different meanings. The term is now gradually being replaced by more precise chemical descriptions.

Valence was first defined as the number of hydrogen atoms that can combine with each atom of an element. For example, each atom of oxygen can combine with two hydrogen atoms to form water (H_2O). Therefore, oxygen has a valence of two. A second definition of valence is based on the charges of ionized atoms. Sodium ions have one positive charge, so the valence of sodium is one. A third definition is based on the number of *bonds* (chemical links) that an atom forms with other atoms. Carbon atoms usually form four bonds, as in the compound *methane* (CH_4). As a result, carbon is said to have a valence of four. Many elements can combine in so many ways that they have several valences. Sulfur has common valences of 2, 4, and 6. JOHN P. FACKLER, JR.

See also CHEMISTRY (Valence); BOND (chemical); LEWIS, GILBERT N.

VALENCIA, *vuh LEN shuh* (pop. 210,222), lies in the fertile northern part of Venezuela, a short distance from the coast. For location, see VENEZUELA (color map). It is the country's largest manufacturing center. Industries include sugar mills, textile mills, and tanneries. Valencia was founded in 1555.

VALENCIA, *vuh LEN shuh* (pop. 653,690), is the third largest city in Spain. Only Madrid and Barcelona are larger than Valencia. Valencia lies on the Turia River, 3 miles (5 kilometers) from the Mediterranean coast and its port of Villanueva del Grao (see SPAIN [map]). Hundreds of years ago, the Romans built walls around their settlement at Valencia. These walls were torn down in 1871. A gate called Torres de Serranos was built in 1238. Two towers were added in the late 1300's, and restored in 1930.

The city is one of the railroad centers of eastern Spain, and carries on a large export trade in oranges and other fruits. Valencia is noted for its silk, colored tiles, tobacco, textiles, and iron and bronze wares. The city's products also include cement, furniture, musical instruments, paper, toys, and perfumes and cosmetics.

Valencia was long occupied by the Moors. It has rows of white houses built in the Moorish style, and many famous public buildings dating from the 1200's, although today much of the city is modern. The University of Valencia is well known. STANLEY G. PAYNE

VALENS, *VAY lenz* (A.D. 328-378), was the Roman emperor who allowed large numbers of barbarians to settle on Roman territory. In A.D. 376, the Visigoths, threatened by other barbarians, sought refuge along the empire's northern boundaries. Valens let them settle there, hoping to integrate them into his army. But Roman officials mistreated the Visigoths, and they revolted. In 378, they killed Valens and destroyed his army at Adrianople (now Edirne, Turkey). The Visigoths soon became the first independent barbarian nation in the Roman Empire (see GOTH). Valens was born in what is now Hungary. His brother, Emperor Valentinian I, named him co-emperor to administer the eastern provinces in 364. A believer in *Arian heresy*, which denied the divinity of Christ, Valens persecuted many orthodox Christians (see ARIANISM). WILLIAM G. SINNIGEN

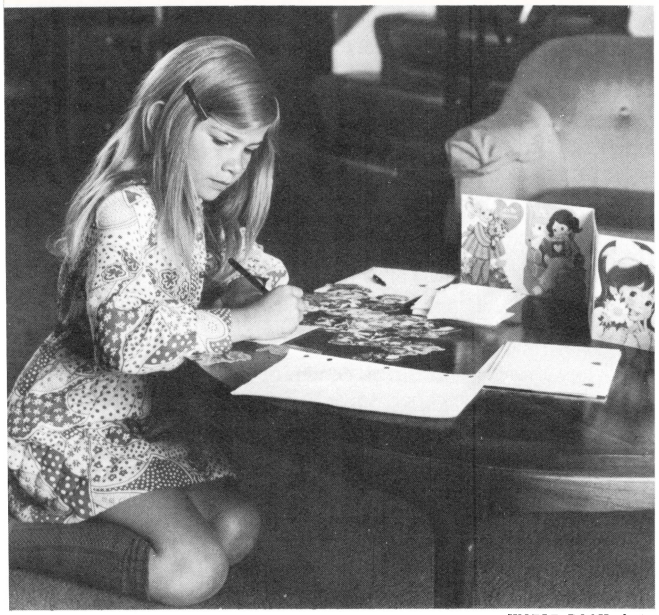
VALENTINE, SAINT, is the name associated with two martyrs of the early Christian Church. Little is known about them. The Roman history of martyrs lists two Saint Valentines as having been martyred on February 14 by being beheaded. One supposedly died in Rome and the other at Interamna, now Terni, 60 miles (97 kilometers) from Rome. There is no conclusive evidence for doubting the existence of either man.

The Saint Valentine who died in Rome seems to have been a priest who suffered death during the persecution of Claudius the Goth about A.D. 269. A basilica was built in his honor in Rome in A.D. 350, and a catacomb containing his remains was found on this location.

Another history of martyrs mentions a Saint Valentine who was bishop of Interamna and who may have been martyred in Rome. By being remembered both in Rome and in Interamna, he may have come to be considered as two persons, but this is not entirely certain.

The custom of exchanging valentines on February 14 can be traced to the English poet, Geoffrey Chaucer. He mentioned that birds began to pair off on that day (see VALENTINE'S DAY). JAMES A. CORBETT and FULTON J. SHEEN

VALENTINE'S DAY



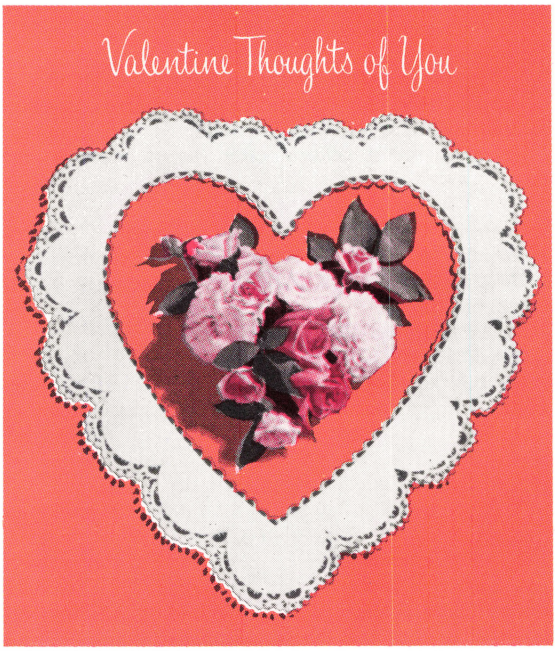
WORLD BOOK photo

Sending Valentines to friends and loved ones is an annual custom in many countries on Valentine's Day, February 14. Many children and adults make their own valentines.

VALENTINE'S DAY is celebrated on February 14 as a festival of romance and affection. People send greeting cards called *valentines* to their sweethearts, their friends, and members of their families. Verses on many valentines contain tender thoughts. Other valentines may include humorous pictures and sayings. But almost all ask, "Be My Valentine."

Valentine's Day comes on the feast day of two different Christian martyrs named Valentine. But the customs connected with the day have nothing to do with the lives of the saints. They probably come from an ancient Roman festival called *Lupercalia* which took place every February 15. The festival honored Juno, the Roman goddess of women and marriage, and Pan, the god of nature.

Valentine's Day is not a business or bank holiday. Schools and businesses remain open as usual. But, during the weeks before the festival, merchants sell valen-

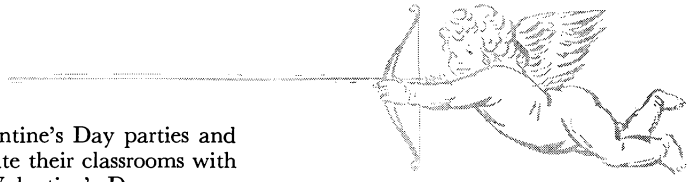


Hallmark Cards

Popular Valentines of Today have fancy covers, decorated with flowers and paper lace. They open to reveal words of friendship, a sentimental verse, or a simple message of love.

Hallmark Historical Collection, Courtesy Hallmark Cards

Elaborate German Mechanical Valentines were the most popular of all kinds from 1890 to 1910. Angelic figures adorned many of the cards. The ruffled paper folded flat for mailing.



tines and decorations for Valentine's Day parties and dances. School children decorate their classrooms with bright red paper hearts. On Valentine's Day, women and girls receive gifts, candy, or flowers from their favorite "valentines."

Valentine's Day Around the World

In the United States and Canada, children exchange valentines with their school friends. In some schools, the children hold a classroom party and place all the valentines in an attractive box that they have made. At the end of the day, the teacher or one child distributes the valentines. Some young persons send valentines through the mail without signing their names. They simply write, "Guess Who." Elementary-school children like to make their own valentines from paper doilies, red paper, wallpaper samples, and pictures cut from magazines. Sometimes they buy do-it-yourself valentine boxes that contain all the materials needed to make valentines. They often send their largest and most elaborate valentines to their mothers and teachers.

Older students enjoy Valentine's Day dances and parties. They may make candy baskets, favors, and place cards, all gaily trimmed with cupids and red hearts. Men often send their wives or sweethearts flowers or boxes of candy instead of valentine greeting cards. The candy boxes are usually shaped like hearts and tied with bright red ribbon.

In Great Britain, children sing special Valentine's Day songs and receive gifts of money, fruit, or candy. Housewives in the county of Rutland bake tasty Valentine's Day buns that contain caraway seeds and plums or currants. Years ago, children in Norfolk County played a game similar to tag on Valentine's Day. The person tagged had to pay a forfeit of some small valentine token. In the town of Norwich, a young suitor would secretly leave a basket of gifts on his loved one's doorstep. Then he would knock on the door and run away.

In Italy, people in some areas hold a Valentine's Day feast on February 14. In Sicily, some young unmarried women get up before sunrise on Valentine's Day. They stand by their windows, sometimes for hours, watching for a man to pass the house. Each girl believes that the first man she sees, or someone who looks like him, will become her bridegroom within the year.

In Denmark, some persons send pressed snowdrop flowers to special friends on Valentine's Day. The Danes call one type of valentine *gaekkebrev*, or joking letter. The sender writes an original rhyme but does not sign his name. He uses a code of dots, with one dot representing each letter of his name. If his young lady guesses his name and tells him, he rewards her with an Easter egg on the following Easter.

Beliefs and Customs

Years ago, people held many beliefs in connection with Valentine's Day. One of the oldest beliefs said that birds choose their mates on February 14. An old English superstition warned that it was bad luck to bring snowdrops into the house before Valentine's Day if unmarried girls in the home hoped to be married before the end of the year.

Most Valentine's Day customs were concerned with romance or the choice of a mate. Single girls had many ways of learning the identity of their future husbands. Sometimes a girl wrote her boy friends' names on bits of paper and rolled each name in a little piece of clay. She then dropped the clay into water. The first scrap of paper to rise to the top was supposed to contain the name of her true valentine. Some unmarried girls pinned five bay leaves to their pillows on the eve of Valentine's Day. They pinned one leaf to the center of the pillow and one to each corner, and believed they would see their future husbands in their dreams if the charm worked.

In Derbyshire, England, young women circled the church 12 times at midnight and repeated the words, "I sow hempseed, hempseed I sow, he that loves me best, come after me now." After that, their true valentine was supposed to appear. Some young ladies rose early on February 14, looked through their keyholes, and hoped to see two objects. If a girl saw only one object in her first peep through the keyhole, she supposedly had little chance of being married that year.

In some places, an unmarried girl would strike her forehead with a folded rose petal. If the petal cracked, the girl knew that her valentine loved her. When a girl finally married, she could no longer take part in romantic Valentine's Day customs. The poet Robert Herrick wrote of the bride:

She must no more a-maying
Or by rosebuds divine
Who'll be her valentine.

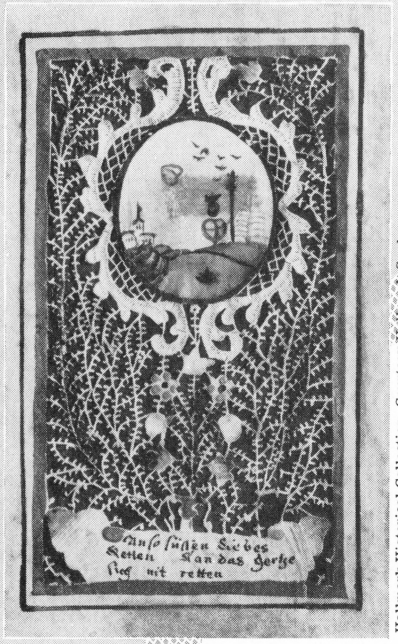
History

The Romans celebrated their feast of Lupercalia as a lovers' festival for young people. Young men and women chose partners for the festival by drawing names by chance from a box. Then the partners exchanged gifts as a sign of affection. They usually continued to enjoy one another's company long after the festival. Many such courtships ended in marriage.

After the spread of Christianity, churchmen tried to give Christian meaning to the pagan festival. In 496, Pope Gelasius changed the Lupercalia festival of February 15 to Saint Valentine's Day on February 14. But the sentimental meaning of the old festival has remained to the present time.

Historians disagree about the identity of St. Valentine. One St. Valentine was a priest who lived in Rome during the 200's under Emperor Claudius II. The Romans jailed him for aiding persecuted Christians. People believe that he cured his jailkeeper's daughter of blindness. About A.D. 270, the Romans beheaded him on Palatine Hill at the site of an ancient altar to Juno. Many years later, Christians named a gate in Rome *Porto Valentini* after St. Valentine. The name was later

VALENTINES THROUGH

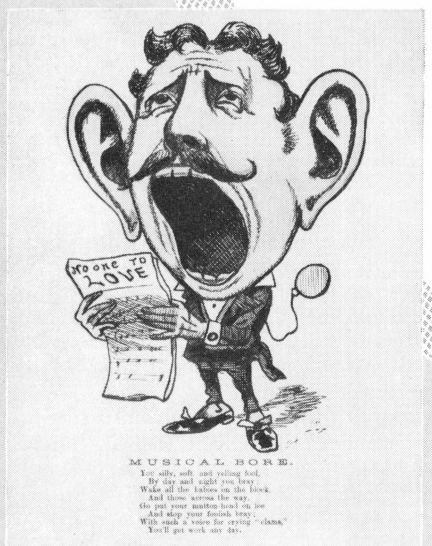


Hallmark Historical Collection, Courtesy Hallmark Cards

The Oldest Valentines in America are some small cards with German script, probably made by nuns and monks in the early 1700's.

Hallmark Historical Collection, Courtesy Hallmark Cards

An English Valentine from 1815, printed from a copperplate by James Kendrew, was highly colored by hand. It bears a sentimental verse.



Hallmark Historical Collection, Courtesy Hallmark Cards

The Comic Valentines of 1850 to 1870, printed on cheap paper and sometimes called "Penny Dreadfuls," probably began in America.

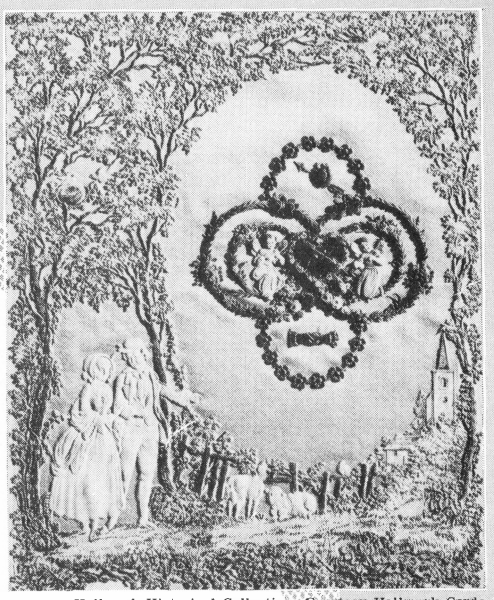
A Flowery Message of Love appeared on this lovely lithographic valentine, made by Louis Prang in Boston in 1884. Lithographs first became popular around 1840.

Hallmark Historical Collection, Courtesy Hallmark Cards

THE YEARS

Hallmark Historical Collection, Courtesy Hallmark Cards

The "Unrequited Love," or "Despondent Lover" type of valentine was a favorite kind in the early 1800's. This card from the 1830's has a fancy, embossed border.



Hallmark Historical Collection, Courtesy Hallmark Cards

A Decorated Satin Center framed by a raised design of English lace appeared on this 1850 valentine by Esther Howland, the first American manufacturer of valentines.

The Kate Greenaway Type of Valentine, which usually featured pictures of children and a lacy border, became popular in the late 1800's.

Hallmark Historical Collection, Courtesy Hallmark Cards

Norcross Collection of Old Valentines

A Doily-like Greeting of the Kate Greenaway style has an elaborate border but little room devoted to verse. Drawings of "little women" type children highlight the card.

changed to *Porta del Popolo*. St. Valentine's remains are buried in the church of St. Praxedes in Rome.

Another St. Valentine was a bishop of Interamna (now Terni) about 60 miles (97 kilometers) from Rome. One source says that he was persecuted for converting a Roman family to Christianity. He was beheaded in Rome about A.D. 273.

Historians know little about early celebrations of Valentine's Day. According to *Popular Antiquities*, a book by John Brand published in 1877, people in England observed the holiday as early as 1446. In early days, young people chose their valentines by writing names on slips of paper, then drawing them by chance from a vase. An account of the celebration of the holiday in the 1700's describes how social groups met "in the homes of gentry" on the eve of Valentine's Day to carry out this custom. After drawing lots, each young man wore the paper with his lady's name on his sleeve for several days. The expression, "He wears his heart on his sleeve," probably came from this custom.

Young men often presented gifts to their valentines. In some places, the young man gave his lady a pair of gloves. Among wealthy families, men gave fancy-dress balls in honor of their valentines. The custom of sending sentimental messages gradually replaced that of giving fine gifts.

In the United States, Valentine's Day became popular in the 1800's. A writer in a magazine of 1863 wrote, "Indeed, with the exception of Christmas, there is no festival throughout the world which is invested with half the interest belonging to this cherished anniversary." Many valentines of that period were hand painted. They usually showed a fat cupid whose arrows pierced a heart. Some of these valentines had satin, ribbon, and lace trimmings. Feathers, mother-of-pearl, tassels, imitation gems, sea shells, and even dried flowers and seaweed decorated others. Some of the elaborate cards cost as much as $10 apiece. Many old valentines, which are usually valued for their decorative qualities, have become collectors' items. ELIZABETH HOUGH SECHRIST

See also CUPID; GREETING CARDS; LUPERCALIA; VALENTINE, SAINT.

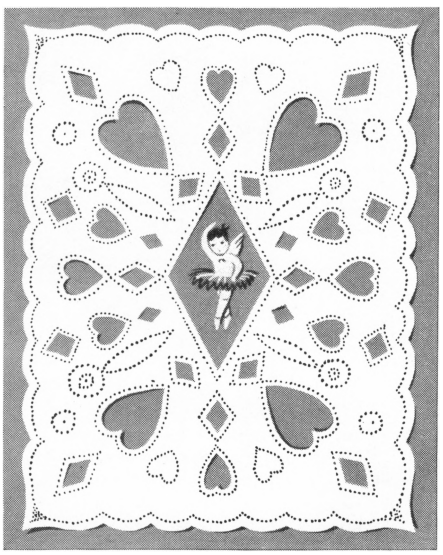
VALENTINIAN was the name of three western Roman emperors. Two of them were important.

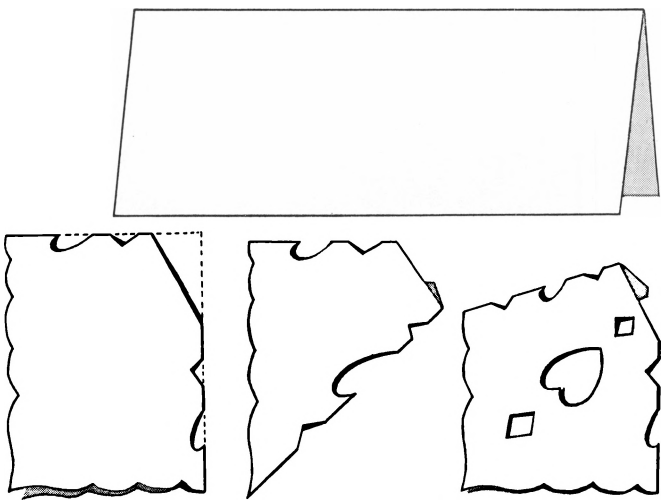
Valentinian I (A.D. 321-375) was born in Pannonia (now parts of Austria, Hungary, and Yugoslavia) to a poor family. He became a famous army officer. In A.D. 364, he was chosen emperor after the death of Jovian. Valentinian appointed his brother Valens coruler, and gave him the eastern provinces to rule. Valentinian was a capable emperor who ruled with absolute power. He tried to protect the poor from dishonest government officials and powerful senators. He allowed his people almost complete religious freedom. Throughout his reign, the Alamanni, the German tribes in the north, and the desert tribes in Africa, rebelled, and he fought many wars against them. He died during a campaign against the Quadi, a German tribe living in what is now a region in Czechoslovakia called Moravia.

Valentinian III (A.D. 419-455) was the son of the Emperor Constantius and grandson of Theodosius I. He became emperor in 425, at the age of six. His mother, Galla Placidia, governed for him during his boyhood. He became so dependent on her that after she died he was a weak and purposeless ruler. When barbarians attacked the West Empire on all sides, Valentinian's general, Flavius Aëtius, won great victories over the Huns and Visigoths in Gaul (now France). But the empire was too weak to resist fully, and was gradually broken up. The Vandals conquered Africa, the Scots and Picts won Britain, and the Visigoths and the Suevi took over much of Spain and Gaul. Valentinian levied high taxes to replace the lost revenues from these provinces, and the people grew rebellious. In 454, Valentinian had Aëtius murdered, and a year later he was assassinated by Aëtius' followers. WILLIAM G. SINNIGEN

VALENTINO, RUDOLPH (1895-1926), known as "the great lover," became the most sensational romantic

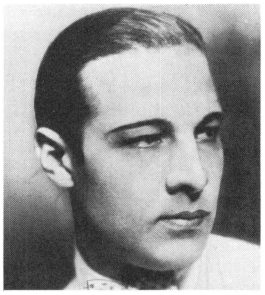
HOW TO MAKE A VALENTINE





Fold a sheet of paper in quarters and cut out heart and diamond shapes along the folded edges. Cut a fancy edge along the other two sides. Make two more folds and cut out designs. Then open the paper and use a pin to prick holes around the designs. Paste on red paper and place a figure in the middle.

actor of the silent motion pictures. His films include *The Sheik* (1921) and *Blood and Sand* (1922). His Latin handsomeness made him a "matinee idol."



Wide World

Rudolph Valentino

Valentino was born Rodolpho d'Antonguolla in Castellaneta, Italy. He came to the United States when he was 18 and worked at several jobs before becoming a film actor. Valentino appeared in minor roles for several years. He became a star in *The Four Horsemen of the Apocalypse* (1921). Valentino died suddenly after an operation. NARDI REEDER CAMPION

VALERA, EAMON DE. See DE VALERA, EAMON.

VALERIAN. See ROMAN EMPIRE (table).

VALERIAN family includes more than 300 different kinds of perennial or annual herbs and some shrubs. These grow mostly in the Northern Hemisphere. Several members of this family are grown as garden or border flowers, and two as potherbs for flavoring food.

One group of valerians has strong-smelling underground parts. Its flowers are small and colored white or reddish. A well-known species is the *common valerian*, or *garden heliotrope*. It yields an oil used in medicine.

The two species grown as potherbs are called *corn salad*, or *lamb's-lettuce*, and *Italian corn salad*. Both grow about 1 foot (30 centimeters) high. They are native to southern Europe, but corn salad has been introduced in Central Europe and North America. Italian corn salad has pink flowers. Corn salad has blue flowers. Both are grown in spring and fall. Plants should be about 6 inches (15 centimeters) apart.

Scientific Classification. Valerians belong to the valerian family, *Valerianaceae*. Common valerian is genus *Valeriana*, species *V. officinalis;* corn salad is *Valerianella olitoria;* Italian corn salad is classified as *Valerianella eriocarpa*. THEODOR JUST

VALÉRY, *vah lay REE*, **PAUL** (1871-1945), was a French poet. He wrote two famous long poems, "La Jeune Parque" (1917) and "Le Cimetière marin" (1920), and a collection of shorter poems, *Charmes* (1922). Valéry completed few poems because he believed that poets should work carefully and deliberately rather than be guided by inspiration. He thought that a bad poem resulting from long, careful calculation was better than a masterpiece resulting from chance. Valéry's model of the perfect artist was Leonardo da Vinci. In the essay *Introduction to the Method of Leonardo da Vinci* (1895), he maintained that structure is the basic quality of artistic creation and compared the work of the poet to that of the engineer.

Most of Valéry's nonfiction reflects the attitude of the late 1800's that only through a thorough knowledge of oneself can a person understand the universal psyche. In his book *Regarding the Real World* (1931), Valéry viewed modern man as a Hamlet wavering between self-destruction and self-preservation. ANNA BALAKIAN

See also FRENCH LITERATURE (The Four Masters).

VALET. See HOTEL (Unpacking); KNIGHTS AND KNIGHTHOOD (The Squire).

VALHALLA, *val HAL uh*, was the great hall of the dead heroes in Norse mythology. The word means *Hall of the Slain*. It was the most magnificent palace in Asgard, and Odin feasted there with his heroes.

Valhalla had walls of gold and a roof of battle shields. Huge spears held up its ceiling. They were so highly polished that the gleam from them was the only light needed. The 540 doors were so wide that 800 men could enter side by side. The guests sat at long tables. They were the dead heroes who had been brought to Valhalla by the Valkyries, or battle maidens. The Valkyries waited on the tables and served luxurious food.

The heroes rode out to the battlefield to fight every morning. They often wounded each other terribly, but their hurts were healed before they returned to Valhalla for the noonday feast. PADRAIC COLUM

See also ODIN; VALKYRIE.

VALKYRIE, *val KIR ee*, was one of the warlike goddess-maidens of Norse mythology. The Valkyries rode on swift horses and were armed with spears, shields, and helmets. Odin sent them to battlefields to choose dead heroes, take them to Valhalla, and serve them feasts. The name means *those who choose the fallen*. Brunhild, the maiden Sigurd awakened from a magic sleep, was a Valkyrie. Richard Wagner built his opera *Die Walküre* around this theme. See also BRUNHILD; ODIN; OPERA (*Ring of the Nibelung, The*); VALHALLA. EINAR HAUGEN

VALLANDIGHAM, *vuh LAN dih gum*, **CLEMENT LAIRD** (1820-1871), an Ohio politician, criticized President Abraham Lincoln's Civil War policies. Vallandigham was one of the best known of the northern Copperheads or Peace Democrats. He favored compromise with the South, and was arrested and charged with treason in 1863. President Lincoln banished him to the Confederacy, but he escaped to Canada.

Vallandigham was born in New Lisbon, Ohio. He served in the Ohio state legislature in 1845 and 1846, and in the U.S. Congress from 1858 to 1863. During his exile in 1863, Ohio Democrats nominated him for governor, but he lost the election. Vallandigham returned to the United States in 1864, but he never regained political prominence. FRANK L. KLEMENT

VALLE, *VAH yay*, **JOSÉ CECILIO DEL** (1780-1834), a Central American patriot and statesman, wrote the Central American Declaration of Independence, proclaiming freedom from Spain on Sept. 15, 1821. He became a leader of Guatemala's independence movement in 1821. Mexico annexed Guatemala in 1822, and imprisoned Valle briefly. He was elected vice-president of the Central American Confederation in 1823, but refused to serve. Valle was born in Honduras. HARVEY L. JOHNSON

VALLEJO, *vuh LAY oh*, Calif. (pop. 71,710), is the home of the California Maritime Academy, and of the Mare Island Naval Shipyard, one of the nation's largest naval shipyards. The city lies about 30 miles (48 kilometers) northeast of San Francisco (see CALIFORNIA [political map]). Vallejo, Fairfield, and Napa form a metropolitan area with 251,129 persons. Many of Vallejo's residents work at the shipyard, but others work in other Bay Area communities. Vallejo was founded in 1850. It was California's capital from 1851 to 1853. It has a council-manager government. GEORGE SHAFTEL

See also MARE ISLAND NAVAL SHIPYARD.

VALLETTA, *vuh LEH tuh* (pop. 15,615), is the capital and chief seaport of Malta. It lies on a narrow peninsula between the harbors on Malta's northeast coast. Valletta is the administrative, cultural, and commercial center of Malta. It serves as a naval base for both the British Navy and the North Atlantic Treaty Organization (NATO). Valletta is the home of the Royal Malta Library. The Royal University of Malta, the island's only university, is at Msida, just outside Valletta. The Cathedral of Saint John and the Palace of the Grand Masters (now the governor general's residence) are among the city's sights.

Valletta became the capital of Malta in 1571. It had been founded about five years earlier. Valletta was named for Jean Parisot de la Vallette, grand master of the Knights of Malta.

See also MALTA (map; picture).

VALLEY is a natural trough in the earth's surface. It is the most important feature of the landscape. Systems of valleys extend through plains, hills, and mountains. Streams and rivers flowing through valleys drain interior land regions to the ocean. Many valleys have fertile soil and make excellent farmland.

All valleys are similar in shape. The bottom of a valley is called its *floor*. The floor usually slopes gradually in one general direction. Mountain valleys usually have narrow floors. But in low-lying plains, a valley floor may be several miles or kilometers wide. The part of the valley floor along river banks is called the *flood plain*. The flood plain is part of the river channel, but it is used only during a flood. Buildings on it may be damaged when the river floods. The sides of a valley are called *valley walls* or *valley slopes*. The ridge formed where the walls of neighboring valleys meet is called a *divide*.

Kinds of Valleys. Various kinds of valleys are named according to their appearance. A deep valley with steep walls is called a *canyon*. One of the most famous canyons is Grand Canyon in Arizona. Along coastlines, valleys that are flooded by the ocean are called *drowned valleys*. Chesapeake Bay and Delaware Bay are drowned valleys. Where a valley joins a larger valley from the side, the two floors usually meet at the same level. But sometimes the floor of the side valley is higher than the floor of the main valley where they join. The side valley is then called a *hanging* valley. A river flowing through a hanging valley may form a waterfall where the water enters the main valley.

Not all valleys are on land. Many deep *submarine* canyons are found on the slopes leading up from the ocean floor to the edge of the continental shelf. Hudson Canyon is a submarine canyon. It extends south-eastward down the continental shelf to the Atlantic Ocean floor from a point near New York City.

How Valleys Are Formed. Most valleys on dry land are formed by the running water of streams and rivers, and by the erosion of slopes leading to them. Erosion moves material down the slopes to the valley floor where the stream carries it to a lake or to the ocean. In addition, the stream may erode its channel deeper.

A valley may also be formed when a long, narrow section of the earth's crust sinks below the surrounding area. A valley formed in this way is called a *rift valley*. One system of rift valleys extends about 4,000 miles (6,400 kilometers) from the Sea of Galilee south through the Red Sea, and into southeastern Africa.

Glaciated valleys are valleys that were enlarged by the action of glaciers. These valleys are often found high in mountains. They are U-shaped rather than V-shaped.

SHELDON JUDSON

Related Articles in WORLD BOOK include:

Canyon
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Delaware Water Gap
Engadine
Erosion
Hanging Valley
Imperial Valley
Matanuska Valley
Ocean (illustration: Atlantic Ocean Floor)
Shenandoah Valley
Trossachs
Valley of the Kings
Wyoming Valley

VALLEY CITY STATE COLLEGE. See UNIVERSITIES AND COLLEGES (table).

VALLEY FORGE, Pa. (pop. 450), is a village on the Schuylkill River, about 45 miles (72 kilometers) west of Philadelphia. General George Washington and his men camped there in the winter of 1777 and 1778, during the Revolutionary War. These months were discouraging for the Americans. Washington's Continental Army had to endure several months of suffering.

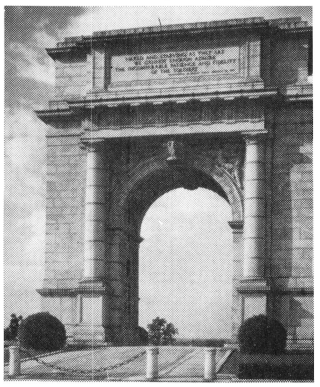
Conditions at Valley Forge. Washington led his troops to Valley Forge after his defeats at Philadelphia and Germantown, Pa. His soldiers had little food, and too little clothing to protect themselves from the cold. The Continental Congress could not provide additional supplies to fill the men's needs. The army of about 11,000 lived in crude log huts that they built themselves. On Dec. 23, 1777, Washington wrote: "We have this day no less than 2,873 men in camp unfit for duty because they are barefooted and otherwise naked."

More than 3,000 soldiers died during this period. Many others were either too weak or too sick to fight, because of a smallpox epidemic. At the same time, the people around Valley Forge were enjoying all the comforts of a rich countryside, because little fighting took place at this time. The British lived a gay life in Philadelphia. The American soldiers found the region about the camp unfriendly to them.

The winter at Valley Forge tested the loyalty of the American troops. Only dedicated patriots stayed with the Continental Army. Many persons criticized Washington, but he held his position at Valley Forge throughout the winter and spring. In spite of all the difficulties, he improved his troops with the help of Baron von Steuben. This Prussian general drilled the soldiers in a system of field formations. When spring came, Washington had a disciplined, well-trained army. The news of the alliance between France and the United States reached Valley Forge on May 6, 1778. It cheered Washington, and helped him to move successfully against the British in June.

Valley Forge State Park covers about 2,000 acres (810 hectares) of the camp-

Ewing Galloway



National Memorial Arch in Valley Forge State Park honors the gallant American soldiers who camped there during the winter of 1777-1778.

Soldiers at Valley Forge, cold, hungry, and sick, endured what has been often called the "Winter of Despair" in 1777 and 1778.

Ayer Collection, Newberry Library

ing ground. The park's buildings and monuments were built in memory of Washington's Continental Army. The old stone house he used as headquarters still stands there. Other buildings in the park include the Washington Memorial Chapel, National Memorial Arch, Cloister of Colonies, and Valley Forge Museum of Natural History. MARSHALL SMELSER

See also REVOLUTIONARY WAR IN AMERICA; WASHINGTON, GEORGE; STEUBEN, BARON VON.

VALLEY OF TEN THOUSAND SMOKES. See KATMAI NATIONAL MONUMENT.

VALLEY OF THE FALLEN. See SPAIN (Architecture).

VALLEY OF THE KINGS is a rocky, narrow gorge, which was used as a cemetery by the *pharaohs* (kings) of ancient Egypt between 1550 and 1200 B.C. The Valley, sometimes called the *Valley of the Tombs of the Kings*, lies on the west bank of the Nile River at Thebes. Sixty-two tombs have been discovered in the Valley.

The tombs are in the form of corridors and chambers cut into rock. Carved and painted religious signs and hieroglyphic texts cover the walls. The art work deals mainly with the activities of a dead king in the hereafter. The tomb of Seti I, discovered in 1817, is the largest and most ornate tomb. Other tombs in the Valley of the Kings include those of Tutankhamon and Ramses III. RICARDO A. CAMINOS

VALMY, BATTLE OF. See ARMY (Famous Battles).

VALOIS, *VAH LWAH*, was the family name of a branch of the great Capetian line of French kings (see CAPETIAN DYNASTY). The House of Valois ruled France from 1328 to 1589. Philip VI, the first of the Valois kings, came to the throne after Charles IV died. Charles VIII died in 1498 without any sons, and the throne passed to Louis, Duke of Orléans. He died in 1515 without a male heir and the throne passed to Francis of Angoulême. Francis was crowned Francis I and became the first of the Angoulême branch of the House of Valois. Henry III, who died in 1589, was the last of the Angoulêmes, and Henry IV, who followed him, was the first Bourbon. FRANKLIN D. SCOTT

See also CHARLES (VIII); FRANCIS (I) of France; HENRY (III) of France; LOUIS (XII); PHILIP (VI).

VALOIS-ORLÉANS, HOUSE OF. See ORLÉANS.

VALPARAÍSO, *VAHL pah rah EE soh* (pop. 286,108), is the principal seaport and second largest city of Chile. Valparaíso lies on a wide inlet of the Pacific Ocean about 70 miles (110 kilometers) northwest of Santiago. For location, see CHILE (political map). *Valparaíso* is Spanish for *Valley of Paradise*.

Valparaíso is a modern and progressive city, and an important manufacturing center. The chief products include cotton goods, machinery, tobacco, refined sugar, and liquor. The city has many fine public buildings and schools. An electric railroad joins Valparaíso with Santiago, and another line joins the city with the mining section of inland Chile. In 1906, a severe earthquake destroyed parts of the city. KALMAN H. SILVERT

See also SOUTH AMERICA (picture: Steamships).

VALPARAISO UNIVERSITY. See UNIVERSITIES AND COLLEGES (table).

VALUE, in economics, means the power of a commodity to command other commodities in exchange. Value relates to the terms upon which one commodity exchanges for others. It must not be confused with price. A commodity's *price* means its exchange power in terms of money (see PRICE). Its *value* means its exchange power in terms of other commodities.

Value and Utility. In order to possess value, an article must have *utility*. That is, it must have the power to satisfy a want. For example, farm products always have value because everyone desires them. So farmers can usually find a market for their products. The desire for articles must be backed by purchasing power. No article will have any value if those who want it have no money or commodities to offer in exchange for it.

A thing may have great value and still be used in ways which harm mankind. For example, drugs and alcohol possess great utility. They are of benefit to man when used properly. But they become harmful when people misuse them or become addicted to them.

Value and Scarcity. In order to possess value, an article must be scarce. That is, it must be so limited in quantity that those who have it are able to get something else in exchange for it. Air, which has great utility, seldom has any value. There is so much of it that ordinarily everyone can have all he wants without having to pay anyone for it. But under certain conditions, air does have value. A good illustration is compressed air, which is bought and sold. HAROLD G. MOULTON

VALUE, in color. See COLOR (Characteristics).

VALUE ADDED BY MANUFACTURE is a statistic used to measure and compare manufacturing activity. For example, if a state had a total value added by manufacture of $10 billion in 1960 and $20 billion in 1970, its manufacturing activity has doubled. Value added by manufacture is one of the chief measures of economic activity used by the U.S. government.

Value added by manufacture is the increase in value of raw material after it becomes a finished product. It

represents the effect of manufacturing in terms of money. To compute this value, economists subtract the cost of materials, supplies, containers, fuel, electricity, and contract work from the value of manufactured products as they leave the factory. LEONARD S. SILK

VALUE-ADDED TAX is a tax imposed by a government at each stage in the production of a good or service. The tax is paid by every company that handles a product during its transformation from raw materials to finished goods. The amount of the tax is determined by the amount of the value that a company adds to the materials and services it buys from other firms.

Suppose that a company making scratch pads buys paper, cardboard, and glue worth $1,000. Then it spends an additional $100 on rent, telephone calls, and delivery costs. It sells the scratch pads for $1,600. The company would pay a value-added tax on $500. This figure is arrived at by subtracting the cost of materials ($1,000) and operating expenses ($100) from the sale price ($1,600). Thus, $1,600 − 1,000 − 100 = $500.

Most firms that pay a value-added tax try to pass this expense on to the next buyer. As a result, most of the burden of this tax eventually falls on the consumer. The tax is levied at a fixed percentage rate and applies to all goods and services. In 1954, France became the first nation to adopt a value-added tax. Several other European countries have since done so. JOHN R. COLEMAN

VALVE is a term used for various mechanical devices which open and close to control the flow of fluids in pipes and vessels. The term also is used in physiology for natural growths in the body which serve much the same purpose as mechanical valves. Among these are the valves of the heart, which open and close to control the flow of blood through the chambers of the heart.

There are also several types of mechanical valves, including the *automatic*, the *nonautomatic*, and *slide* valves.

Automatic valves are opened and closed by the pressure and back pressure of the fluid. The valve proper is a little gate which swings open on one side of an opening. When the liquid pressure is behind the valve, the pressure forces the valve open, and pushes through. Then pressure on the other side forces the valve back against the opening, closing the valve. The valves in the heart operate in this way. Nonautomatic valves are operated by an outside force. The valve in a common water faucet is opened and shut by turning a handle.

A slide valve works like the valve on a steam-engine cylinder. The moving part of the valve slides back and forth across the openings made in the cylinder, opening and closing them by changing the direction of motion of the sliding part of the valve. OTTO A. UYEHARA

See also CARBURETOR; GASOLINE ENGINE; SAFETY VALVE.

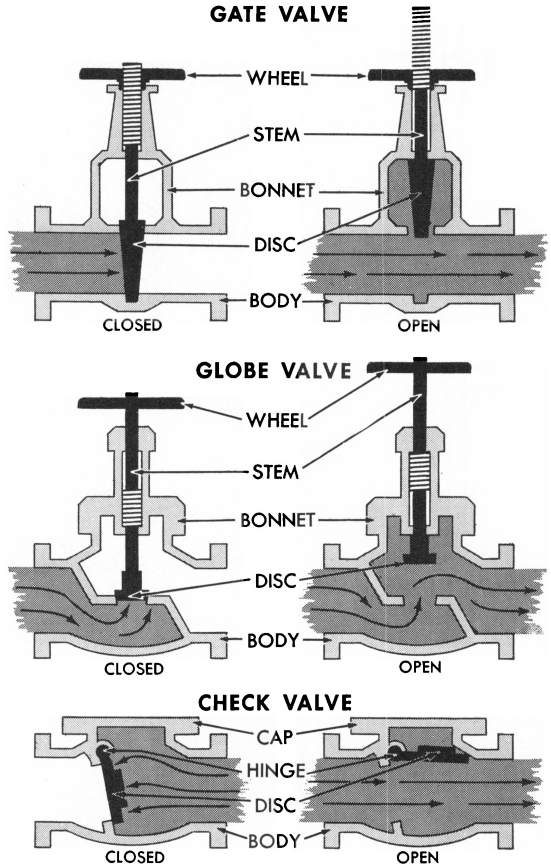
VAMPIRE is a corpse that supposedly returns to life at night to suck people's blood. According to many folk stories, a vampire must have a constant supply of fresh blood obtained by biting the neck of sleeping victims. The victims lose strength, die, and become vampires themselves.

Stories of vampirelike creatures have come from many parts of the world. But most vampire tales originated in Eastern European and Balkan countries, such as Albania, Greece, Hungary, and Romania. There are many superstitions about vampires. People who commit suicide, die violently, or are condemned by their church supposedly become vampires. According to folklore, a vampire can be destroyed by driving a wooden stake through its heart. In Europe, from the late 1600's to the early 1800's, people dug up graves looking for vampires.

The horror novel *Dracula* (1897), by the English author Bram Stoker, ranks as the most famous vampire story. Stoker based the character of Dracula on an actual person, Vlad Tepes, a cruel prince from Walachia (now part of Romania). Vlad was nicknamed Dracula, which in Romanian means *son of the devil* or *son of a dragon*. A number of motion pictures have been made about Dracula. ALAN DUNDES

See also STOKER, BRAM.

VAMPIRE BAT is the name given several different bats. The name is given particularly to certain bats in Central America and tropical America, which attack men, fowl, and other warm-blooded animals, and drink their blood. The best known is the *common vampire bat*, a small reddish-brown animal about 3 inches (8 centimeters) long. It has very sharp triangular-shaped front teeth, which cut like a razor. Its esophagus is short and narrow, and will permit nothing but fluids to pass.



Principal Types of Valves. The nonautomatic gate and globe valves are used to turn on or shut off the flow of liquids. The check (automatic valve) allows a liquid to flow in one direction, but it closes shut to stop flow in the opposite direction.

Vampire bats sometimes attack persons who are sleeping. The bite itself is harmless and soon heals, but many vampire bats carry rabies. Vampire bats have destroyed livestock and other animals in some localities, and have also infected humans.

William A. Wimsatt & David G. Allen

Vampire Bat

Weird stories have been told about the viciousness of these mammals. Their peculiar name comes from the superstitious legends about the vampire, an imaginary being that sucked the blood from humans.

Scientific Classification. True vampire bats make up the vampire bat family, *Desmodontidae*. They form three genera, *Desmodus*, *Diaemus*, and *Diphylla*. The common vampire bat is genus *Desmodus*. FRANK B. GOLLEY

See also BAT; VAMPIRE.

VAN, LAKE. See LAKE VAN.

VANADIUM, a chemical element, is a silvery-white metal that is used to toughen steel and other metals. Mixtures of vanadium and other metals form very strong alloys (see ALLOY). Vanadium resists attack from many chemicals, and its alloys do not rust. Vanadium steels are used to make automobile frames, gears, springs, and axles. Carbon-vanadium steels are used to make locomotive parts.

Vanadium remains strong at high temperatures and conducts heat rapidly. It also allows atomic particles called *neutrons* to pass through it. For these reasons, vanadium is used in some atomic reactors.

Vanadium never occurs as a metal. It is found combined with other elements. Sources of vanadium include the minerals patronite, a combination of vanadium and sulfur; vanadinite, a combination of lead, chlorine, and vanadium; and carnotite, a compound of uranium and vanadium.

Most commercial vanadium is made from patronite. Patronite is heated to remove the sulfur, and sodium carbonate is added to form sodium vanadate (Na_3VO_4). Sulfuric acid is then added, causing the vanadium to combine with oxygen and form vanadium pentoxide (V_2O_5). The pentoxide is heated either with carbon or aluminum to remove the oxygen and leave fairly pure vanadium.

Small amounts of pure vanadium can be prepared by the iodide-decomposition process. This process is based on the thermal decomposition of vanadium iodide (VI_2) on an electrically heated filament.

Vanadium forms few compounds. Vanadium pentoxide is used in the chemical industry as a *catalyst*, a substance that speeds up certain chemical changes or reactions. Vanadium pentoxide is also used as a *mordant* (color-fixer) in dyeing, and to make the dye aniline black.

Vanadium has the chemical symbol V. Its atomic number is 23 and its atomic weight is 50.942. Vanadium melts at 1890° C ($\pm$10° C) and boils at about 3000° C. It was first discovered in 1801 by Andrés del Río of Mexico, who called it *erythronium*. Later, he thought erythronium was only impure chromium. Nils Sefström, a Swedish chemist, rediscovered the element in 1830, and called it vanadium. ALAN DAVISON

See also ELEMENT, CHEMICAL (tables).

VAN ALLEN, JAMES ALFRED (1914-), a physicist, discovered the Van Allen radiation belts that circle the earth. His team of scientists used data from the United States Explorer and Pioneer satellites to make the discovery in 1958. See VAN ALLEN RADIATION.

Van Allen was born in Mount Pleasant, Iowa, and graduated from Iowa Wesleyan College and the University of Iowa. He became head of the University of Iowa department of physics and astronomy in 1951. He was one of the chief planners of the International Geophysical Year of 1957-1958. R. T. ELLICKSON

See also INTERNATIONAL GEOPHYSICAL YEAR.

VAN ALLEN RADIATION is a concentration of particles in two regions of space above the earth's atmosphere. These regions are usually called the Van Allen belts. The belts are part of a larger region of space, the *magnetosphere*, that surrounds the earth. In the magnetosphere, the earth's magnetic field traps electrically charged particles and controls their behavior. The trapped particles reach particularly high concentrations in the two Van Allen belts.

The Van Allen belts encircle the earth somewhat like irregularly shaped doughnuts. The inner belt is densest about 2,000 miles (3,200 kilometers) above the earth. The outer belt is densest from 10,000 to 12,000 miles (16,000 to 19,300 kilometers) up.

The inner belt seems to consist mostly of protons and electrons, and the outer belt consists almost entirely of electrons. When the belts were first discovered, astronomers thought these particles probably came from the thin stream of gases thrown off by the sun. These gases are called the *solar wind* (see SOLAR WIND). Later experiments seemed to suggest other possible sources. Astronomers have still not reached general agreement on the source of the particles. The charged particles produce dangerous X rays when they strike a spacecraft, and so special precautions must be taken to shield astronauts from this radiation.

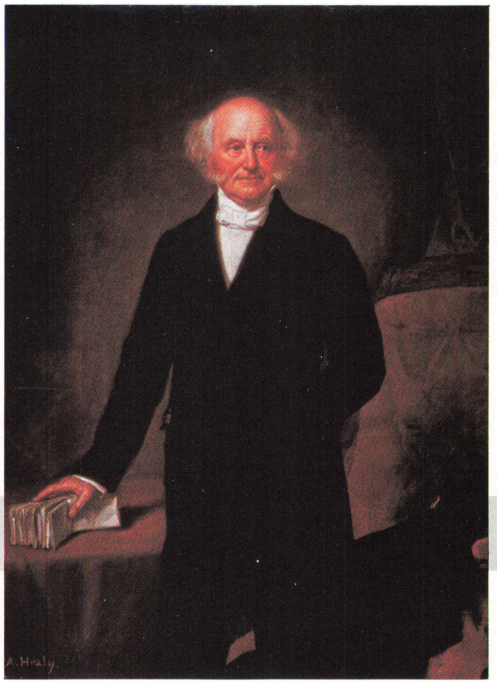
The belts were named for James A. Van Allen, an American physicist. His space satellite experiments first detected the inner belt in 1958. The Pioneer III space probe discovered the outer belt later that same year. ERIC D. CARLSON

See also SPACE TRAVEL (Problems of Space Flight; illustration).

VANBRUGH, *van BROOK*, **SIR JOHN** (1664-1726), was an English playwright and architect. He was the last of the Restoration period writers who satirized the manners of his day. In his first and most famous play, *The Relapse* (1696), he attacked the preference for sentimentality in drama. Aside from *The Provoked Wife* (1697), his other plays are adaptations from the French. They are carelessly written, but contain passages of genuine wit.

Vanbrugh was more successful as an architect. He designed Blenheim Palace in Oxfordshire and the Queen's Theater in London, and helped design the Clarendon Building in Oxford. The Queen's Theater was an ornate structure that was used for opera and pantomime in the 1700's. Vanbrugh was born in London. ALAN S. DOWNER

MARTIN VAN BUREN



Oil painting on canvas (1864) by George Peter Alexander Healy;
© White House Historical Association (National Geographic Society)

The United States Flag had 25 stars when Van Buren took office.

J. Q. ADAMS
6th President
1825—1829

JACKSON
7th President
1829—1837

W. H. HARRISON
9th President
1841

TYLER
10th President
1841 — 1845

8TH PRESIDENT OF THE UNITED STATES 1837-1841

VAN BUREN, MARTIN (1782-1862), ran for President three times, but won only the first time. He served during the nation's first great depression, the Panic of 1837. The panic brought financial ruin and misery to millions. Many turned to the government for help, but Van Buren refused all public aid. He believed in Thomas Jefferson's theories that government should play the smallest possible role in American life. "The less government interferes," Van Buren explained, "the better for general prosperity."

Van Buren's erect bearing and high, broad forehead gave him a dignified appearance. He had served as Vice-President under Andrew Jackson, and, as President, Van Buren inherited much of Jackson's popularity. But during the three years of the panic, Van Buren bore the anger of a disappointed people. His enemies accused him of being a sly, scheming politician. They called him "The Little Magician" and "The Fox of Kinderhook." They ridiculed his courteous manners. When Van Buren continued to deal politely with his political rivals, they said this showed his lack of deep convictions.

By defending his Jeffersonian ideals, Van Buren demonstrated that actually he had both deep convictions and courage. Partly because he refused to compromise, Van Buren was defeated for re-election in 1840 by William Henry Harrison, whom he had beaten in 1836. Van Buren ran again for President in 1848, but finished a poor third.

In Van Buren's time, Washington, D.C., was still a city of muddy streets and few trees. One traveler said: "It looks as if it had rained naked buildings upon an open plain." But life in the capital reflected the excitement of a growing country. The first railroad into Washington was completed in time to bring visitors from New York City and Philadelphia to Van Buren's inauguration. Frontiersmen such as Sam Houston mingled with courtly Southerners and proper New Englanders. Washington hostesses sought out the popular author, Washington Irving, for their dinner parties. Out West, the frontier town of Chicago became an incorporated city, and the Republic of Texas began its fight for statehood.

Early Life

Childhood and Education. Martin Van Buren was born in the Dutch community of Kinderhook, N.Y., on Dec. 5, 1782. He was the third of the five children of Abraham and Maria Hoes Van Buren. Martin had an older brother and sister, and two younger brothers. His mother was the widow of Johannes Van Alen, and had three other children by her first marriage. Abraham Van Buren ran a truck farm and a tavern. As a child, Martin enjoyed listening to the tavern patrons as they argued politics in the Dutch language.

IMPORTANT DATES IN VAN BUREN'S LIFE

1782 (Dec. 5) Born in Kinderhook, N.Y.
1807 (Feb. 21) Married Hannah Hoes.
1812 Elected to the New York Senate.
1819 (Feb. 5) Hannah Hoes Van Buren died.
1821 Elected to the United States Senate.
1828 Elected Governor of New York.
1829 Appointed Secretary of State.
1832 Elected Vice-President of the United States.
1836 Elected President of the United States.
1840 Defeated for re-election by William H. Harrison.
1848 Nominated for President by the Free Soil party.
1862 (July 24) Died in Kinderhook, N.Y.

Martin attended the village school. At the age of 14, he began to study law under Francis Sylvester, a local attorney. He showed great talent, and Sylvester soon let him work in court. Martin first took part in a court trial at the age of 15. Another lawyer from Sylvester's office had tried the case. As he was about to sum up his arguments, he turned to Martin and said: "Here, Mat, sum up. You may as well begin early." The boy was rewarded that day with a silver half dollar. He soon became a familiar sight in the village court.

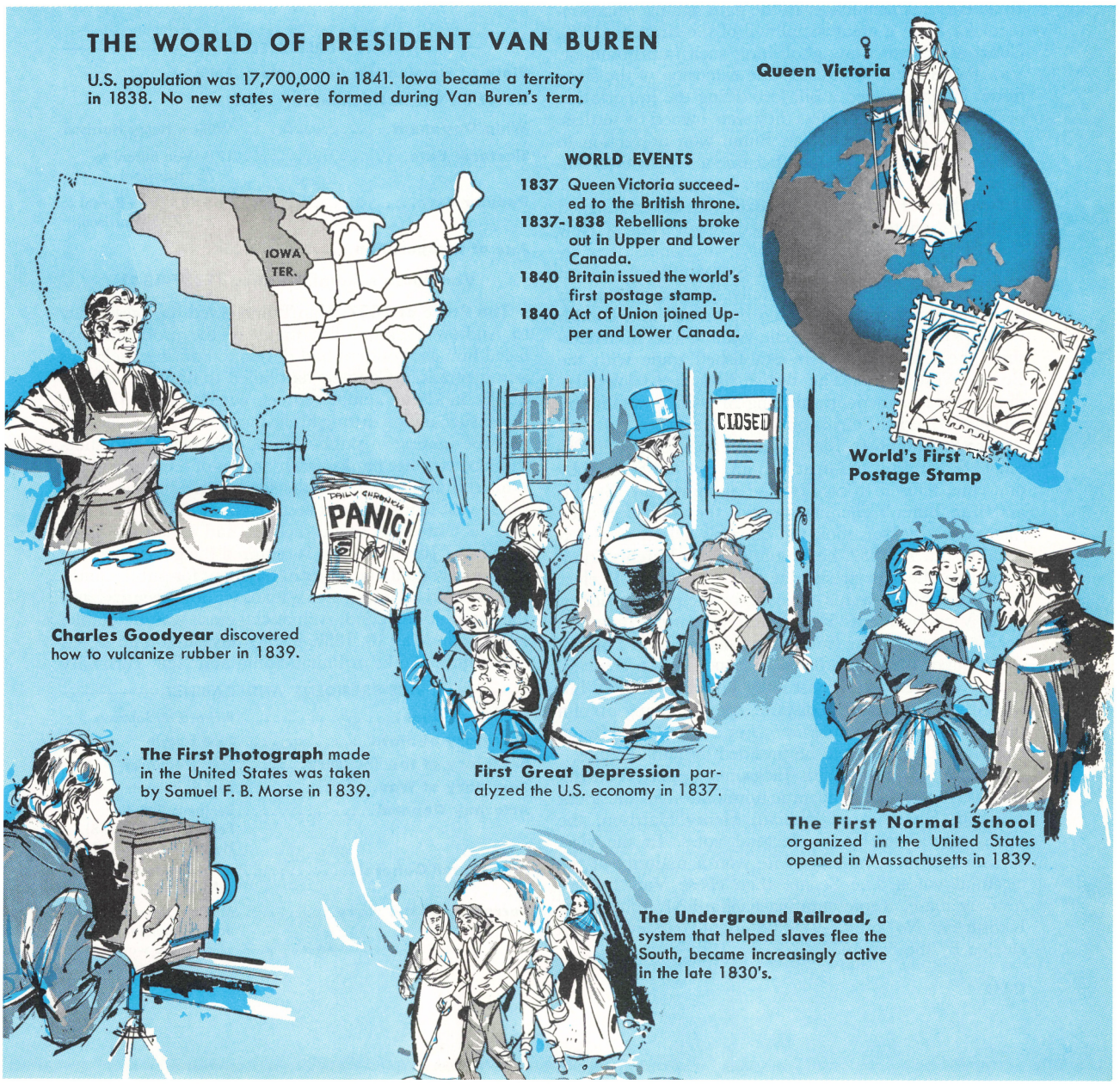
In 1801, Van Buren moved to New York City to continue his studies. He was admitted to the bar in 1803, and opened a law office in Kinderhook with his half brother, James I. Van Alen.

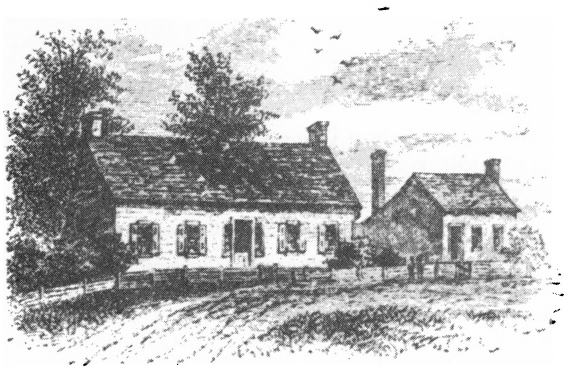
Van Buren's Family. On Feb. 21, 1807, Martin Van Buren married his distant cousin and childhood sweetheart, Hannah Hoes (March 8, 1783-Feb. 5, 1819). Mrs. Van Buren died 18 years before her husband became President. The couple had four sons. Abraham, the eldest, was his father's White House secretary, and later served on the staff of General Zachary Taylor during the Mexican War. John, the second son, became attorney general of New York.

Political and Public Career

Van Buren's enthusiasm for the ideas of Thomas Jefferson took him into politics as a Democratic-Republican (see DEMOCRATIC-REPUBLICAN PARTY). He was elected to the New York senate in 1812. Shortly after his re-election to the senate in 1816, Van Buren was appointed attorney general of New York.

U.S. Senator. In 1820, a split in the Democratic-Republican party of New York gave Van Buren a chance to show his ability as a political leader. Governor De Witt Clinton tried to get John C. Spencer into the U.S. Senate through a special election. Van Buren split with Clinton, and successfully managed the election of Rufus King, an independent Federalist. A year





From *A History of Old Kinderhook* by Edward A. Collier, G. P. Putnam's Sons, 1914

Van Buren's Birthplace was in the Dutch community of Kinderhook, N.Y. The house has been torn down, and the only record of what it looked like comes from drawings made during Van Buren's lifetime.

later, when the other Senate seat was vacated, Van Buren's standing had so increased that the legislature elected him.

Van Buren took his seat in the Senate on Dec. 3, 1821. He became a leader in the fight against imprisonment for debt, a great social evil of the time. In 1828, Congress passed a law abolishing such imprisonment. Van Buren also tried to stop the extension of the slave trade. He introduced a bill forbidding the importation of slaves into Florida unless they were owned by settlers. This bill was defeated. Van Buren won re-election to the Senate in 1827. He soon became a supporter of Andrew Jackson for the presidency.

Secretary of State. Late in 1828, Van Buren resigned from the Senate after being elected governor of New York. He served as governor only two months, then resigned to become Secretary of State under President Jackson. Van Buren successfully pressed claims for damages to American shipping by French and Danish warships during the Napoleonic Wars. Under his leadership, the United States re-established trade with the British West Indies. The British had closed West Indian ports to American shipping in 1826 in retaliation for high American tariffs on British goods.

Vice-President. In 1831, Jackson appointed Van Buren U.S. Minister to Great Britain. But the Senate, by one vote, refused to confirm the appointment. By this act, Van Buren's enemies thought they had destroyed his career. Jackson took the Senate's action as a personal insult. In 1832, he supported Van Buren's nomination to the vice-presidency. He also made it clear that Van Buren was his choice to be the next President.

As Vice-President, Van Buren supported Jackson's decision to withdraw federal deposits from the Bank of the United States (see BANK OF THE UNITED STATES). Senate debates over the issue became increasingly bitter. At the height of the dispute, rumors sprang up of a plot to assassinate Van Buren. For a time, Van Buren carried loaded pistols as he presided over the Senate.

Election of 1836. With Jackson's support, Van Buren easily won the Democratic nomination for President in 1836. He defeated William Henry Harrison, the Whig candidate, by 97 electoral votes. In the vice-presidential race, no candidate won a majority of the electoral votes. The Senate then chose Van Buren's running mate, Representative Richard M. Johnson of Kentucky. No other Vice-President has ever been elected by the Senate.

Painting by Henry Inman, Frick Art Reference Library

Angelica Singleton Van Buren, the President's daughter-in-law, served as hostess of the White House. Van Buren's wife, Hannah Hoes Van Buren, died 18 years before he became President.

VAN BUREN'S ELECTION

Place of Nominating Convention..Baltimore

Ballot on Which Nominated.....1st

Whig Opponent.....William Henry Harrison

Electoral Vote.....170 (Van Buren) to 73 (Harrison)

Popular Vote.....765,483 (Van Buren) to 739,795 (Harrison)

Age at Inauguration.....54

Van Buren's Administration (1837-1841)

The Panic of 1837. Van Buren owed the presidency to Andrew Jackson. But many of the problems that faced him as President had developed during Jackson's administration. Congress had failed to limit the sales of public lands to actual settlers, even though Jackson urged such action during his last year in office. Everyone was speculating in public lands, even clerks and shoeshine boys. State banks and branches of the Bank of the United States had joined the speculative splurge. They made vast loans without security in gold or silver. Unable to limit land sales, Jackson had issued his *Specie Circular* of July 11, 1836. It required the government to accept only gold and silver in payment for public lands. Banks could no longer make loans without security, and the speculation ended. A financial crash was inevitable. It came on May 10, 1837, just 67 days after Van Buren took office. Banks in Philadelphia and New York City

VICE-PRESIDENT AND CABINET

Vice-President.....Richard M. Johnson

Secretary of State.....John Forsyth

Secretary of the Treasury.....Levi Woodbury

Secretary of War.....Joel R. Poinsett

Attorney General.....Benjamin F. Butler
Felix Grundy (1838)
Henry D. Gilpin (1840)

Postmaster General.....*Amos Kendall
John M. Niles (1840)

Secretary of the Navy.....Mahlon Dickerson
James Paulding (1838)

*Has a separate biography in WORLD BOOK

closed, and soon every bank in the country did likewise. The first great depression in American history had begun.

The Independent Treasury. Van Buren felt no responsibility for the effects of the depression on the people. As President, he was worried only because federal funds on deposit in private banks were in danger. He therefore proposed that an independent treasury be created to hold government funds. A bill putting this plan gradually into effect passed Congress on July 4, 1840. Van Buren called it a "second Declaration of Independence." The independent treasury was abolished in 1841, after Van Buren left office. It was reestablished in 1846 under President James K. Polk.

Life in the White House. Van Buren avoided extravagant White House parties because of the depression. He limited his entertaining to simple dinners. Many visitors to the Executive Mansion found the atmosphere formal and austere, even with Van Buren's four sons present. The people of Washington admired the modesty and personal charm of the youths, all in their 20's. But many, especially Dolley Madison, regretted the lack of a woman in the household. She introduced the President's eldest son, Abraham, to Angelica Singleton of South Carolina. A romance soon developed, and the young people were married in late 1838. Angelica Van Buren assumed the role of White House hostess.

Growing Unpopularity. The depression was only one of many disturbances during Van Buren's administration. Border disputes developed with Canada. In 1839, a boundary dispute between Maine and neighboring New Brunswick nearly resulted in open warfare. Van Buren handled the problem with tact, and the dispute was settled peacefully. But he received little credit for his efforts. See NEW BRUNSWICK (Aroostook War).

Antislavery leaders blamed Van Buren for the expensive war to drive the Seminole Indians from Florida. They feared the region might become a new slave state. Proslavery leaders attacked the President for not working to annex Texas. They believed he did not want to admit a new slave state into the Union.

Election of 1840. The Democrats nominated Van Buren for re-election in 1840 in spite of his unpopularity. Vice-President Johnson had so many enemies that he failed to gain renomination. The Democrats could not agree on any vice-presidential candidate. As a result, Van Buren became the only presidential candidate in American history to seek election without a running mate. The Whigs again nominated William Henry Harrison for President, and chose former Senator John Tyler of Virginia as his running mate.

Harrison launched a boisterous campaign in which he attacked Van Buren as an aristocrat who had no interest in the unemployment caused by the depression. Using the slogan "Tippecanoe and Tyler too," Harrison campaigned on the basis of his colorful military career. Few persons were surprised when Van Buren lost by an electoral vote of 234 to 60. But many were amazed by the close popular vote. Of 2,400,000 votes cast, Van Buren lost by fewer than 150,000. See HARRISON, WILLIAM HENRY (Elections of 1836 and 1840).

Later Years

Van Buren retired to his country estate, Lindenwald, near his birthplace. He remained active in politics for more than 20 years. In 1848, the antislavery Free Soil party nominated him for President (see FREE SOIL PARTY). He lost the election, but took so many New York votes from Democrat Lewis Cass that the Whig candidate, Zachary Taylor, was elected.

As the slavery disputes grew hotter, Van Buren made his antislavery position clear. But he remained a loyal Democrat, supporting Franklin Pierce in 1852 and James Buchanan in 1856. He opposed Abraham Lincoln at first in 1860, but gave him loyal support after the election. Van Buren died at Lindenwald on July 24, 1862, and was buried beside his wife in Kinderhook.

Authoritative books on Van Buren include *American Talleyrand* by H. M. Alexander and *Martin Van Buren* by E. M. Shepard. Van Buren wrote an autobiography, *An Inquiry into the Origin and Course of Political Parties in the United States.*

HUGH RUSSELL FRASER

Related Articles in WORLD BOOK include:

Depression
Harrison, William Henry
Jackson, Andrew
Johnson, Richard Mentor
President of the United States
Vice-President of the United States

Outline

I. Party Life
- A. Childhood and Education
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II. Political and Public Career
- A. U.S. Senator
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- C. Vice-President
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III. Van Buren's Administration (1837-1841)
- A. The Panic of 1837
- B. The Independent Treasury
- C. Life in the White House
- D. Growing Unpopularity
- E. Election of 1840

IV. Later Years

Questions

Whose support assured Van Buren's nomination for President?

What events caused Van Buren to lose popularity?

How did Van Buren's candidacy in 1848 affect the presidential election?

What social evil did Van Buren oppose as Senator?

How did an attempt to ruin Van Buren in 1831 backfire?

Why did Van Buren refuse to give federal aid to the people during the Panic of 1837?

Why was Van Buren called "The Fox of Kinderhook"?

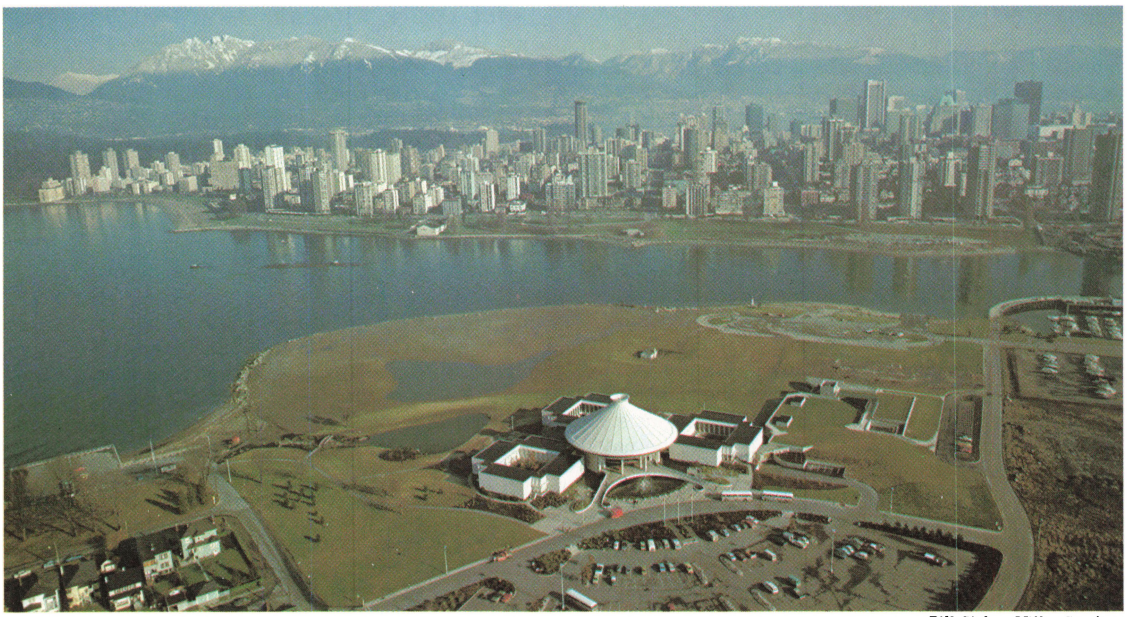
What was Van Buren's plan to protect federal funds from the effects of a depression?

Why did Vice-President Van Buren carry loaded pistols while presiding over the Senate?

Why was Van Buren the only man ever to run for President without a vice-presidential running mate?

VANCE, ZEBULON BAIRD (1830-1894), was a Confederate governor of North Carolina and a Democratic United States Senator. He opposed secession, but served in the Confederate Army. He became governor of North Carolina in 1862, and devoted himself to supplying North Carolina soldiers. He bought a steamship for the state, and brought food, arms, and medicines through the blockade. He was elected to the United States Senate in 1870, but was refused his seat. He was elected governor again in 1876 and served in the U.S. Senate from 1879 until his death. He was born in Buncombe County, North Carolina. Vance represents North Carolina in Statuary Hall.

W. B. HESSELTINE



Bill Staley, Miller Services

Vancouver Is North America's Leading Pacific Coast Port. It also ranks as the largest city and chief industrial and commercial center of British Columbia. Skyscrapers border English Bay and face the Centennial Museum and the H. R. MacMillan Planetarium, *foreground.*

VANCOUVER, *van KOO vuhr,* is the largest city in British Columbia and the busiest port on the Pacific Coast of North America. It also ranks as the fifth largest city in Canada. About half of British Columbia's people live in the Vancouver metropolitan area. The city is the province's major center of commerce, culture, industry, and transportation.

Vancouver lies in southwestern British Columbia, about 25 miles (40 kilometers) north of the Canadian-United States border. The city's chief asset is its natural harbor in Burrard Inlet. The harbor is connected with the Pacific Ocean by English Bay, the Strait of Georgia, and Juan de Fuca Strait. Ships can use the port the year around because the harbor's waters never freeze. The port handles nearly all of Canada's trade with Japan and other Asian nations. Vancouver is often called *Canada's Gateway to the Pacific.*

The first permanent settlement on the site of what is now Vancouver grew up near a sawmill built in 1865. Rich timber resources in the area helped the settlement become a bustling lumber town. In 1884, the Canadian Pacific Railway selected the site as the western terminal of Canada's first transcontinental railroad. William Van Horne, the railroad's general manager, named the town for Captain George Vancouver, a British explorer who had sailed into Burrard Inlet in 1792.

Greater Vancouver

Vancouver covers about 45 square miles (117 square kilometers) on the southern shore of Burrard Inlet. The city lies in a beautiful setting, near the Coast Mountains and the ocean. The protective mountains, and warm winds blowing in from the Pacific, help provide a surprisingly mild climate for a city so far north. Vancouver's temperatures average 36° F. (2° C) in January and 63° F. (17° C) in July.

The Vancouver metropolitan area, called *Greater Vancouver,* occupies 531 square miles (1,375 square kilometers). Greater Vancouver is Canada's third largest metropolitan area. Only the Toronto and Montreal metropolitan areas have a larger population.

The City lies on two ridges that are separated partly by a shallow inlet called False Creek. Stanley Park, the main recreational area, is on the shorter, northern ridge. Farther south and east on this ridge are downtown Vancouver and rows of high-rise apartment buildings in a section known as the West End. The broader, southern ridge includes the East End, a large section of single-family homes.

The intersection of Granville and Georgia streets is the heart of downtown Vancouver. The 30-story Toronto Dominion Bank Tower rises over the intersection.

FACTS IN BRIEF

Population: 426,256. *Metropolitan Area Population*—1,082,352.

Area: About 45 sq. mi. (117 km²). *Metropolitan Area*—531 sq. mi. (1,375 km²).

Altitude: 38 feet (11.6 m) above sea level.

Climate: *Average Temperature*—January, 36° F. (2° C); July, 63° F. (17° C). *Average Annual Precipitation* (rainfall, melted snow, and other forms of moisture)—47 inches (119 cm). For the monthly weather in Vancouver, see BRITISH COLUMBIA (Climate).

Government: Mayor-council. *Terms*—2 years for the mayor and the 10 council members.

Founded: 1865. Incorporated as a city in 1886.

It stands in Pacific Centre, a complex that also has a department store and an underground shopping center. The city's tallest building, the 33-story Royal Bank Tower, stands nearby at Georgia and Burrard streets. It rises 466 feet (142 meters) in Royal Centre, a development that includes a hotel and shopping mall.

Vancouver's Coat of Arms, adopted in 1969, includes a lumberman and a fisherman. These figures represent two industries that have contributed much to the city's growth.

Several other downtown streets have special characteristics. Robson Street, also known to Vancouver residents as *Robsonstrasse*, its German name, is a fascinating center of European import stores. Restaurants that specialize in French, German, Greek, Italian, and other types of cooking help give the street an international charm. Most of Vancouver's Chinatown, the second largest Chinese community in North America, is on Pender Street. Only San Francisco's Chinatown has a larger population. More than 30,000 persons of Chinese descent live on or near Pender Street, which is lined by restaurants, gift shops, and nightclubs.

Gastown, the original center of Vancouver, consists of a few redeveloped blocks just north of Chinatown. Gastown's old brick buildings and cobblestone streets recall the city's early days. This area has several antique shops and art galleries.

The Metropolitan Area. The Coast Mountains, including two snow-capped peaks called the Lions, rise majestically north of Vancouver. Point Grey, a peninsula, juts into the Strait of Georgia at the west end of the city. The flat, green, delta lands of the Fraser River basin spread south of Vancouver.

Burnaby, Vancouver's largest suburb, borders the city on the east. It has a population of about 125,000. Other suburbs include Delta, North Vancouver, Richmond, Surrey, and West Vancouver.

People

About 70 per cent of Vancouver's people were born in Canada. People of British ancestry make up the largest group. Other large groups include those of Chinese, German, Italian, or Scandinavian descent. The first Chinese residents came during the late 1800's to help build the Canadian Pacific Railway. Many Europeans arrived after World War II ended in 1945.

Vancouver's mild climate has helped make the city a popular retirement center. The climate also attracts large numbers of young people from other parts of Canada. But many of them lack job skills and cannot find work. As a result, they contribute to the city's relatively high rate of unemployment. Poverty is an-

CITY OF VANCOUVER

Vancouver, the largest city in British Columbia, is the busiest port in Canada. The map shows the city and its major points of interest.

City boundary
Main road
Other road
Rail line
Point of interest
Built-up area
Nonbuilt-up area
Park
Indian reserve

WORLD BOOK map

Otto, Miller Services

Lumbering is a chief industry of the Vancouver area. Huge forests near the city provide logs for local sawmills, plywood plants, and pulp and paper mills.

other major problem in Vancouver. Most of the poor live in run-down buildings just east of the downtown section and in parts of the East End.

Members of the United Church of Canada form the largest religious group in Vancouver. The city also has many Anglicans, Lutherans, Presbyterians, and Roman Catholics.

Economy

Trade and Finance. The Port of Vancouver, Canada's busiest port, handles about 40 million short tons (36 million metric tons) of cargo annually. It serves as the main center for the distribution of goods shipped between Canada and Asia. The port is also the center of an important northern coastal trade. More than 50 steamship lines serve Vancouver.

Vancouver is the largest wholesale and retail trading center of Western Canada. About 80,000 workers in Greater Vancouver are employed by wholesale and retail companies. The sales of these firms exceed $2½ billion annually. Almost every large business in British Columbia has its headquarters in the city. The tourist industry ranks among Vancouver's fastest-growing sources of employment.

Vancouver has more banks, loan companies, and other financial institutions than any other city in Western Canada. Trading on the Vancouver Stock Exchange totals about $500 million yearly.

Transportation. Vancouver serves as the western terminal of Canada's two transcontinental railroads, the Canadian Pacific Railway and the Canadian National Railways. The British Columbia Railway, owned by the provincial government, has its general offices in the city. The Burlington Northern connects Vancouver with Seattle and other U.S. cities.

About 2½ million passengers use Vancouver International Airport yearly. Among Canadian airports, only those at Montreal and Toronto serve more passengers. Three major Canadian airlines and several U.S. airlines use Vancouver's airport.

Local transportation facilities in the city include a bus system operated by the provincial government. Ferry lines connect Vancouver and nearby Vancouver Island. The Lions Gate Bridge spans Burrard Inlet. It is 1,550 feet (472 meters) long and links Stanley Park and West Vancouver. The Trans-Canada Highway connects Vancouver and other Canadian cities.

Industry. Greater Vancouver ranks as the most important Canadian industrial center west of Ontario. The approximately 2,000 factories in Greater Vancouver produce about $2 billion worth of goods annually. They employ about 72,000 workers.

The area's leading industries are food processing and the manufacture of wood and wood products. Fish processing and meat packing rank as the chief activities of the food products industry. Vast evergreen forests in and near Greater Vancouver provide the raw materials for the area's sawmills, pulp and paper mills, and veneer and plywood plants. Other leading industrial activities include metal fabricating, the making of paper and related products, and the manufacture of petroleum and coal products.

Communication. Vancouver has two major daily newspapers, *The Province* and *The Sun*. Eight radio stations and three television stations serve the city.

Education

Schools. Vancouver has about 100 public elementary schools and about 20 public high schools, with a total of 70,000 students. The public school system also operates the Vancouver School of Art and the Vancouver Vocational Institute. In addition Vancouver has about 40 church-supported schools and private schools.

The University of British Columbia, on Point Grey, is the second largest university in Canada. It has about 18,000 students, and only the University of Toronto has a bigger enrollment. Simon Fraser University is in Burnaby.

Libraries. The Vancouver Public Library system includes a downtown central library and about 15 branches. The University of British Columbia Library owns nearly 1½ million volumes.

Cultural Life and Recreation

The Arts. The Vancouver Opera Association and the Vancouver Symphony Orchestra perform in the Queen Elizabeth Theatre. The Playhouse Theatre next door presents major stage attractions. The Vancouver Art Gallery features paintings by European masters and Canadian artists.

Museums. The Centennial Museum and the H. R. MacMillan Planetarium form part of a modern cultural center at the mouth of False Creek. The museum features exhibits on the settlement of Western Canada. The planetarium, topped by a tent-shaped dome, presents films about the universe. Nearby on the waterfront, the

Maritime Museum displays the famous Arctic exploring ship *St. Roch*. This vessel was the first to sail through the Northwest Passage from both the west and the east. It made the voyages between 1940 and 1944.

Parks. Vancouver has about 135 parks that cover a total of about 2,700 acres (1,090 hectares). Stanley Park occupies 1,000 acres (400 hectares) and ranks among the largest city parks in Canada. It includes the Stanley Park Zoo and the Vancouver Public Aquarium. The aquarium is one of the finest marine centers in the world and the largest in Canada. It has more than 8,000 specimens and presents shows with two trained killer whales. Stanley Park is also known for its flower gardens. Queen Elizabeth Park includes an arboretum and the Bloedel Conservatory.

Vancouver's mild climate makes it attractive the year around for many outdoor activities, including fishing, golfing, and tennis. Vancouver also has many fine beaches. The Pacific National Exhibition, Western Canada's largest fair, attracts many tourists to Vancouver in late August and early September every year. It includes agricultural and industrial displays and many kinds of entertainment.

Sports. The British Columbia Lions of the Canadian Football League play in Empire Stadium. The Vancouver Canucks of the National Hockey League play in Pacific Coliseum.

Government

Vancouver has a mayor-council form of government. The voters elect the mayor and the 10 members of the city council to two-year terms. Property taxes provide most of the city government's income. But these and other taxes do not provide enough money to pay for public services and needed improvements. As a result, Vancouver depends on funds from the federal and provincial governments to meet its expenses.

Other problems in Vancouver include air and water pollution, a shortage of low-rent housing, and the lack of a rapid transit system. City leaders are also concerned about the increasing rate of construction on land that may be needed for parks or for other recreational use.

History

Salish Indians lived in what is now the Vancouver area before white men arrived. In 1791, Don Jose Marie Narvaez, a Spanish seaman and explorer, became the first European to see the area. Captain George Vancouver sailed into Burrard Inlet in 1792.

The settlement that became Vancouver was founded in 1865, when lumbermen built Hastings Mill on the site. In 1867, John Deighton, a former English sailor, built a saloon nearby to serve the loggers. He had the nickname "Gassy Jack" because he was so talkative, and the community soon became known as Gastown.

Early Growth. In 1884, the Canadian Pacific Railway chose the site of Vancouver as its western terminal. The young lumber town was incorporated as the city of Vancouver in April, 1886. At that time, about 2,000 people lived there. A fire destroyed most of Vancouver two months later, but the people quickly rebuilt their city.

The first Canadian Pacific train reached Vancouver from Eastern Canada in 1887. The city's population rose to 8,000 in 1889. Vancouver began to grow as a seaport in 1891, when ships of the Canadian Steamship Company started to sail between the city and the Orient. By 1901, Vancouver's population had soared to 42,000.

The Great Boom. Between 1900 and 1910, job opportunities made Vancouver the fastest-growing city in Canada. The salmon-canning and wood-processing industries created many of these jobs. Immigrants poured into the city from China, Great Britain, India, Japan, and the United States. In 1904, the Great Northern Railway linked Vancouver with Seattle and other U.S. transportation centers. By 1911, about 86,000 people lived in Vancouver.

The opening of the Panama Canal in 1914 resulted in a tremendous increase of business for Vancouver's port. The canal provided a cheaper way to ship fish, grain, and lumber from Western Canada to Eastern Canada, Europe, and the Eastern United States. By 1921, Vancouver had a population of 163,220. In 1929, the neighboring communities of Point Grey and South Vancouver became part of Vancouver. In 1931, nearly 250,000 people lived in the city.

The Mid-1900's. Vancouver suffered severely during the Great Depression of the 1930's. Thousands of unemployed and homeless people moved to the city from other parts of Canada to seek jobs and relief from the cold winters. Many of these people found no work and took part in several demonstrations against the provincial and federal governments.

World War II (1939-1945) brought prosperity to the city as shipbuilding and other industries expanded. During the war, Vancouver served as headquarters of the coastal defense staffs of the Canadian Army.

The city changed rapidly after the war. Tall apartment buildings appeared in the West End, and modern office towers replaced old structures in downtown Vancouver. In addition, shopping centers were built near many residential areas.

Recent Events. Vancouver's seaport became increasingly important during the late 1960's because of a rapid growth of trade between Canada and Japan. In 1970, a coal-loading terminal equipped to handle the world's largest cargo ships opened just south of Vancouver at Roberts Bank.

Private developers gave the city a new skyline during the 1960's and early 1970's. They erected more tall apartment buildings in the West End and office towers in the downtown area. The downtown developments included Pacific Centre and Royal Centre. In 1974, the city prohibited automobile traffic on a part of Granville Street in downtown Vancouver and turned this section into an attractive mall.

Project 200, another private development, began in 1970 on a 23-acre (9.3-hectare) site on the Vancouver waterfront. A 32-story office building opened there in 1972. Project 200 also included the future construction of apartment and office buildings, a hotel, stores, and a transportation center. ERIC NICOL

See also BRITISH COLUMBIA (pictures); CANADA (picture).

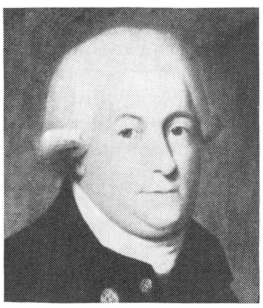
VANCOUVER, Wash. (pop. 41,859), is a port on the Columbia River, directly across from Portland, Ore. (see WASHINGTON [political map]). It is one of the state's largest cities and the seat of Clark County. Its mills produce lumber, veneer, plywood, wood pulp, and paper. Power from the nearby Bonneville Dam aids in the production of aluminum. The city also has food-processing plants. Vancouver is an important port. Its major exports include grain and lumber.

The oldest city in the state, Vancouver was founded by the Hudson's Bay Company in 1824. Captain George Vancouver, for whom the city is named, had entered the mouth of the Columbia River on an exploration trip in 1792. The old trading post site now lies in Vancouver Barracks, an army post established in 1849. Vancouver was incorporated as a city in 1857. It has a council-manager government. HOWARD J. CRITCHFIELD

VANCOUVER, GEORGE (1758-1798), was a British explorer. Vancouver Island and cities in the state of Washington and in British Columbia, Canada, are named after him.

He was born at King's Lynn, Norfolk, England. He entered the navy as an able seaman at the age of 13. His early experiences were on Captain James Cook's two last voyages (see COOK, JAMES). Vancouver served as a midshipman on the last voyage.

An incident concerning Nootka Sound, off the west coast of Vancouver Island, threatened war between Great Britain and Spain. Vancouver was ordered there, and he sailed in April, 1791. He sailed by way of the Cape of Good Hope, Australia, and New Zealand, following Cook's example. He made valuable maps of the coasts of these areas. He reached the American continent in 1792. Vancouver participated in certain formalities involving Nootka Sound, and then sailed through Juan de Fuca Strait and around Vancouver Island, becoming the first white man to sight the Gulf of Georgia on the way. He surveyed the Pacific Coast north of San Francisco for the first time. He returned to England via Cape Horn in 1795, and wrote his report on the voyage. His book, *A Voyage of Discovery to the North Pacific Ocean and Round the World in the Years 1790-1795,* was published in 1798. WILLIAM P. BRANDON



Brown Bros.

George Vancouver

VANCOUVER ISLAND is the largest island on the Pacific Coast of North America, and an important part of the Canadian province of British Columbia. Vancouver Island extends for 285 miles (459 kilometers) along the southwestern coast of Canada and is from 40 to 80 miles (64 to 130 kilometers) wide. Victoria, the largest city on the island, is the capital of British Columbia. The other chief cities are Nanaimo and Port Alberni. The total population of the island is 381,796.

Location, Size, and Surface Features. Vancouver Island is separated from the mainland of British Columbia by Queen Charlotte Strait, Johnstone Strait, and the Strait of Georgia. Juan de Fuca Strait lies south of the island. Vancouver Island covers 12,079 square miles (31,284 square kilometers). It is the southern end of a partly sunken mountain chain, the Island, or Vancouver, Range. The tops of the range rise sharply from the Pacific Ocean to heights of 5,000 to 7,000 feet (1,500 to 2,100 meters). Dangerous reefs and small, rocky islands are common along the western shore. The valleys of the sunken range form many winding, fiordlike bays. Quatsino, Nootka, and Barkley sounds reach into the heart of the island. Pacific Rim National Park is on the western coast. The eastern shore is less rugged and broken, and has a few level stretches.

Vancouver Island shelters the southern coast of British Columbia. The island is about half the size of West Virginia.

Vancouver Island has the mildest climate in Canada because of the Japan Current. There is little winter in the southern part around Victoria, but in the northern and western mountains the winters are often severe.

The Island's Resources. The slopes of the mountains on Vancouver Island are covered with fir, cedar, and hemlock forests. Lumbering is the chief industry. The island has several large pulp mills, sawmills, and plywood plants. Farms are cultivated in the valleys. The southeast coast produces many berries and flower bulbs. Excellent game fishing attracts many tourists to the island.

History. The Spanish explorer Juan Perez first visited Vancouver Island in about 1774. But it was not explored until 1792, when George Vancouver sailed around it. The island is named after him. Later, the United States claimed the island, and the territory on the mainland north to 54°40′. But the United States surrendered its claims to Great Britain in 1846 by the terms of the Oregon Boundary Treaty. The first settlement on Vancouver Island was made in 1843, when the Hudson's Bay Company built Fort Victoria. In 1849, Vancouver Island became a British colony, and in 1866 it was united with mainland settlements to form British Columbia. RODERICK HAIG-BROWN

See also JUAN DE FUCA, STRAIT OF; NANAIMO; NOOTKA INDIANS; VANCOUVER, GEORGE; VICTORIA (B.C.).

VANDAL. The Vandals were a Germanic tribe of barbarians that invaded the Roman Empire during the early A.D. 400's. The Vandals, and other barbarians, helped bring about the empire's decline. The Vandals were probably no more destructive than other bar-

barians, but the word *vandal* has come to mean someone who destroys or damages valuable things.

The Vandals were originally a group of tribes that lived along the southern coasts of what are now Norway, Sweden, Denmark, and the Danish islands. They migrated to central Europe about 100 B.C., and settled in Silesia and Galicia (now in southern Poland). In the late A.D. 300's, the Vandals moved westward because they were threatened by the Huns from the east. The Vandals crossed the northwest boundaries of the Roman Empire in 406, and raided the province of Gaul (now France). In 409, they moved into Spain.

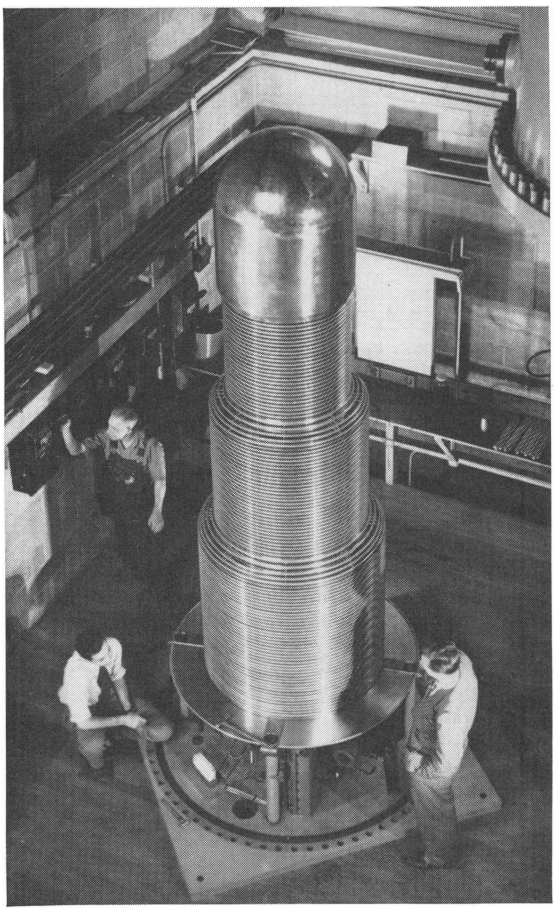
The Vandals reached the peak of their power under King Genseric, who ruled from 428 to 477 (see GENSERIC). They conquered northern Africa and ruled the Mediterranean Sea. In 455, they looted Rome. Byzantine Emperor Justinian I sent forces against them in 533. In 534, these forces captured the Vandals' territories, destroying the Vandals as a nation. WILLIAM G. SINNIGEN

VANDALIA COURT HOUSE. See ILLINOIS (Places to Visit).

VAN DE GRAAFF, ROBERT JEMISON (1901-1967), an American physicist, invented the electrostatic generator named after him. The Van de Graaff generator builds up a high-voltage electric charge useful for nuclear research (see VAN DE GRAAFF GENERATOR).

The First Van de Graaff Generator was built at the Massachusetts Institute of Technology in 1931. Physicists use these particle accelerators for nuclear research.

Massachusetts Institute of Technology



Van de Graaff was born in Tuscaloosa, Ala. He graduated from the University of Alabama in 1922 and did postgraduate work at the Sorbonne in Paris and at Oxford University in England. After doing research in physics at Princeton University, he joined the Massachusetts Institute of Technology staff in 1931.

Van de Graaff built the first model of his generator in 1931 and added improvements in later models. He conducted research in nuclear physics with these devices. In 1946, Van de Graaff helped found the High Voltage Engineering Corporation. This firm manufactures various models of the generator for sale to universities and research institutes. ROGER H. STUEWER

VAN DE GRAAFF GENERATOR, also known as an *electrostatic generator*, is a device for building up a high electrical charge. It is a source of charged particles that may be used for atom smashing. In general, this generator is used to boost protons and other nuclear particles to energy of about 10 million electron volts (10 Mev.). The chief value of the machine is that narrow beams of protons of known energies can be produced. These beams are used to study nuclear forces.

Robert J. Van de Graaff made the first generator of this kind at the Massachusetts Institute of Technology. In the generator, a continuous belt of an insulating material moves past a source of negative electricity. This source sprays electrons on the belt. The belt then goes into a hollow metal dome where a fine metallic brush moves the electrons onto the dome surface. When the charge at the top of the dome is high enough, electrically charged particles are hurled at targets at the bottom of the generator.

Van de Graaff machines work at higher energy when they are enclosed in a pressure vessel. To prevent leakage of the electricity, a gas such as Freon or air under pressure as high as 150 pounds per square inch (10.5 kilograms per square centimeter) is put in the vessel. Electrostatic generators are widely used because they generate a constant supply of voltage. RALPH E. LAPP

See also PARTICLE ACCELERATOR.

VANDENBERG, ARTHUR HENDRICK (1884-1951), was an American statesman and political leader. He was appointed United States senator from Michigan in 1928. He was elected to the Senate a few months later and was re-elected in 1934, 1940, and 1946. He became a Republican leader in the Senate, and was active in molding United States foreign policy.

Vandenberg served as a United States representative at the United Nations conference in San Francisco in 1945. The next year he was a delegate to the Paris Peace conference. In 1947, Vandenberg became president pro tem of the Senate. He gave up his Senate duties in 1950 because of illness. Vandenberg was born in Grand Rapids, Mich. F. JAY TAYLOR

VANDENBERG, HOYT SANFORD (1899-1954), served as chief of staff of the United States Air Force from 1948 to 1953. He was graduated from the United States Military Academy in 1923 and entered the Air Service. In 1942 and 1943, during World War II, he served as chief of staff of the Twelfth Air Force in North Africa. In 1944, Vandenberg became deputy commander in chief of the Allied Expeditionary Air Force, the great

American-British tactical air force which supported General Dwight D. Eisenhower in the 1944 European invasion. In August, 1944, Vandenberg took command of the United States Ninth Air Force, the largest of the American air forces in World War II. In 1947, he became vice-chief of staff of the United States Air Force. He was born in Milwaukee, Wis. ALFRED GOLDBERG

VANDENBERG AIR FORCE BASE, Calif., is the training center for U.S. Air Force ballistic missile crews. Space satellites are launched from the base and from nearby Point Arguello. The base covers about 98,400 acres (39,820 hectares) and lies about 10 miles (16 kilometers) northwest of Lompoc. It was established as Camp Cooke, an Army post, in 1941. It became an Air Force base in 1956 and was renamed for General Hoyt S. Vandenberg. RICHARD M. SKINNER

VANDERBILT is the name of a wealthy American family that became prominent in business and finance.

Cornelius Vanderbilt (1794-1877) founded the family fortune. Vanderbilt succeeded by constantly improving the service on his steamships and railroads and using daring, though sometimes questionable, business tactics.

At 16, he owned and operated a small ferryboat between Staten Island and New York City. During the War of 1812, he had a government contract to transport provisions to forts along New York Harbor. Because of Vanderbilt's steamship interests, he was called "Commodore." By 1850, he was the leading steamboat owner in the nation. He started steamship lines to Europe and a line to San Francisco with an overland route through Nicaragua. Shipping interests netted him an estimated $1 million when he sold out. At 70, he was fighting price wars and manipulating stocks to form railroad combinations. In 1867, he became the first president of the New York Central Railroad (now part of the Penn Central system). By 1873, he owned railroad lines that ran as far west as Chicago, and had helped to create a great U.S. transportation system. When Vanderbilt died, he left a fortune estimated at over $100 million. He did not support charities. But late in life, he gave $1 million to Central (now Vanderbilt) University in Nashville, Tenn., and $50,000 to the Church of the Strangers in New York City. Vanderbilt was born in Staten Island, N.Y.

William Henry Vanderbilt (1821-1885), son of Cornelius Vanderbilt, became president of the New York Central Railroad when his father died. He acquired other railroads, including the Chicago and North Western. He was born in Brunswick, N.J.

Cornelius Vanderbilt II (1843-1899), son of William Henry Vanderbilt, was an official for several major railroads and chairman of the board of the New York Central. He was born in Staten Island.

William Kissam Vanderbilt (1849-1920), another son of William Henry Vanderbilt, became an officer or director of various railroads. He helped found Vanderbilt Clinic in New York City. He was born in Staten Island.

Cornelius Vanderbilt III (1873-1942), son of Cornelius Vanderbilt II, developed several devices used in railroading. He was a director of railroad, insurance, and banking companies. He was born in New York City.

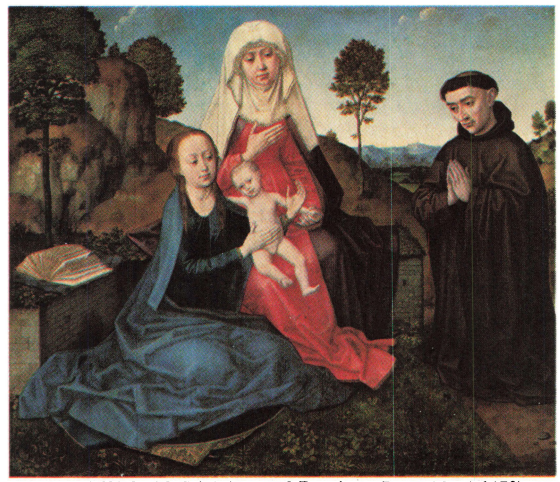
Harold Stirling Vanderbilt (1884-1970), son of William Kissam, became a director of the New York Central Railroad. He invented the game of contract bridge in 1925. He was born in Oakdale, N.Y.

Cornelius Vanderbilt, Jr. (1898-1974), son of Cornelius III, became a well-known reporter, columnist, and author. He was born in New York City. W. H. BAUGHN

VANDERBILT CUP RACE. See AUTOMOBILE RACING.

VANDERBILT MANSION. See NEW YORK (Places to Visit).

VANDERBILT UNIVERSITY is a coeducational, privately controlled school in Nashville, Tenn. It has a college of arts and science, a graduate school, and schools of divinity, engineering, law, medicine, and nursing. The university cooperates with the George Peabody College for Teachers and Scarritt College for Christian Workers so that students may receive credit for work taken in the other institutions. Vanderbilt was first chartered as Central University in 1872. Its name was changed to Vanderbilt University in 1873 in honor of Cornelius Vanderbilt, benefactor of the school. For enrollment, see UNIVERSITIES AND COLLEGES (table). ROBERT A. MCGAW



Virgin and Child with Saint Anne and Franciscan Donor (about 1470), an oil painting on wood; Royal Museum of Fine Arts, Brussels, Belgium

A Van der Goes Painting shows the expressive portraits and realistic landscape background that are typical of his style.

VAN DER GOES, *vahn dur KOOS*, **HUGO** (1440?-1482), was the leading Flemish painter of his generation. He was influenced by Jan van Eyck and Rogier van der Weyden, earlier Flemish artists. But he surpassed them in the earthy solidity of his figures and in his greater understanding of human psychology.

A few of Van der Goes' pictures prove him one of the best portrait artists of his time, but his main contribution to Flemish art consists of several large altarpieces. Among them is the *Adoration of the Shepherds*, painted for an Italian merchant who lived in Bruges, Belgium. It is famous for the vivid portrayal of three adoring shepherds and the charming heads of the merchant's children. His last work is the *Death of the Virgin*, an unforgettable study of human pathos.

Little is known about Van der Goes' youth. In 1467, he was accepted as a master in the artists' guild in Ghent. About 1478, he entered a monastery near Brussels as a lay brother. JULIUS S. HELD

VAN DER WAALS, JOHANNES DIDERIK (1837-1923), a Dutch theoretical physicist, became famous for his work on the behavior of liquids and gases. He won the 1910 Nobel prize in physics for developing the famous equation of state which bears his name. The equation takes into account the forces between the molecules of a gas. Van der Waals was born at Leiden, The Netherlands, on Nov. 23, 1837. He served as professor of physics at Leiden from 1877 until his retirement in 1907. R. T. ELLICKSON

See also MOLECULE (Molecules and Matter).

VAN DER WEYDEN, *vahn der VIE dun*, **ROGIER** (1399?-1464), was a Flemish painter, and a founder of the Flemish movement in painting. He is celebrated for the courtly dignity of his figures, his skillful manner of composition, and his subtle observation of human emotion. He was also a keen student of nature, and painted everything down to the smallest detail in his panels. With an unfailing sense for the beauty of line and the gracefulness of motion, he created masterpieces which influenced Flemish, German, and French art for many years. Some of Van der Weyden's works are lost, but many of his paintings are still preserved. These include *The Madonna with St. Luke*, *The Last Judgment*, and the *Adoration of the Magi*, a *triptych*, or a picture in three panels. His painting *The Descent from the Cross* appears in color in the PAINTING article.

Van der Weyden was born in Tournai, Belgium. He moved to Brussels in the 1430's, where he was appointed "painter of the town." In 1450 he made a trip to Italy. He received commissions from Duke Philip the Good of Burgundy and members of his court. Van der Weyden's portraits preserved the haughty manners and proud bearing of the nobles who were in the court of Duke Philip. JULIUS S. HELD

Painting on wood panel (1464); the Louvre, Paris

Van der Weyden's *Saint Mary Magdalene* shows his skill at portraying dignified figures and realistic landscapes.

VAN DEVANTER, WILLIS (1859-1941), served as an associate justice of the Supreme Court of the United States from 1911 to 1937. His opinions as a Supreme Court justice were consistently conservative. He also served between 1903 and 1910 as a federal circuit judge. Van Devanter was born in Marion, Ind., and was graduated from DePauw University and the Cincinnati Law School. He practiced law in Indiana and Wyoming, and served as chief justice of the Supreme Court of Wyoming in 1889 and 1890. H. G. REUSCHLEIN

VAN DIEMEN'S LAND. See TASMANIA (History).

VAN DINE, S. S. (1888-1939), is the pen name of Willard Huntington Wright, an American author of detective fiction. Van Dine's novels featured the scholarly and snobbish amateur detective Philo Vance. Van Dine introduced Vance in *The Benson Murder Case* (1926). The detective also appears in several other novels, including *The Canary Murder Case* (1928) and *The Dragon Murder Case* (1933). In the Philo Vance stories, the murderers use unusual methods to commit their crimes. Wright was born in Charlottesville, Va. He also wrote art and literary criticism. FREDERICK J. HOFFMAN

VAN DOREN is the family name of two American writers, brothers.

Carl Clinton Van Doren (1885-1950) won the 1939 Pulitzer prize in biography for *Benjamin Franklin*. It is a biography from which one can learn how to write biographies. He wrote *The Great Rehearsal* (1948), an account of the drafting and ratification of the Constitution of the United States. He edited letters of Benjamin Franklin and his sister, Jane Mecom, and published *Jane Mecom* (1950). Van Doren was editor of The Literary Guild from 1926 to 1934, and of The Living Library from 1946 until his death. He was born in Hope, Ill., and was graduated from the University of Illinois. He taught at Columbia University. EDWIN H. CADY

Mark Van Doren (1894-1972) was a distinguished poet, critic, biographer, and fiction writer. He won the 1940 Pulitzer prize in poetry for *Collected Poems*. His other poetry includes *Collected and New Poetry, 1924-1963* (1963) and *Narrative Poems* (1964). Van Doren's *Shakespeare* (1939) was widely praised. He edited *Anthology of World Poetry* (1928) and *The Oxford Book of American Prose* (1932). Collections of Van Doren's fiction works include *Nobody Say a Word and Other Stories* (1953), *Home with Hazel and Other Stories* (1957), and *Collected Stories* (1962).

He was born in Hope, Ill., and was graduated from the University of Illinois in 1914. He received his Ph.D. from Columbia University, where he began teaching in 1920. He was literary editor of *The Nation* magazine from 1924 to 1928. He defended humanistic studies and helped found the Great Books movement. WILLIAM VAN O'CONNOR

Champaign-Urbana Courier

Mark Van Doren

VAN DRUTEN, JOHN WILLIAM (1901-1957), was a playwright who became known for his polished comedies. His plays are noted for their sophisticated dialogue and strong portrayals of women. Van Druten's comedies include *Old Acquaintance* (1940), *The Voice of the Turtle* (1943), *I Remember Mama* (1944), and *Bell, Book and Candle* (1950). He adapted his best-known serious play, *I Am a Camera* (1951), from Christopher Isherwood's stories, *Goodbye to Berlin*.

Van Druten was born in London and taught at University College, Wales. He turned to literature as a career after *Young Woodley* (1925), his second play, succeeded in New York City. The play had been banned in England as an attack on its public school system. Van Druten came to America in 1926, and became a United States citizen in 1944. THOMAS A. ERHARD

VAN DYCK, ANTON (1599-1641), was the most famous portrait painter of the 1600's. His portraits had an especially strong influence on English art. Van Dyck also painted mythological and religious scenes and was a fine engraver and etcher.

Robert Rich, Earl of Warwick (about 1635), an oil painting on canvas; the Metropolitan Museum of Art, New York City, the Jules S. Bache Collection, 1949 (WORLD BOOK photo by Malcolm Varon)

A Typical Van Dyck Portrait shows a full-length figure posed against a landscape background. The portrait above illustrates Van Dyck's drawing skill and his ability to paint rich fabrics.

Van Dyck was born in Antwerp, Belgium. He showed great talent for painting as a boy and had his own studio and pupils at the age of 16. From 1618 to 1620, Van Dyck worked with the famous painter Peter Paul Rubens. Van Dyck visited England briefly in 1620 and then lived in Italy from about 1621 to 1627. He painted in several Italian cities, including Genoa, Rome, and Venice. His portraits of Genoese nobles and their children rank among his finest works. Throughout his career, Van Dyck admired the style of the Venetian artist Titian. Van Dyck's Italian paintings show Titian's influence in their warm colors and free brushwork.

Van Dyck returned to Antwerp in 1627 and worked there for about five years. During this period, he painted his largest and finest religious pictures, including *The Resurrection of Christ*. This painting is reproduced in the WORLD BOOK article on EASTER.

In 1632, Van Dyck moved to England, where King Charles I made him court painter. The artist became popular with English nobles and completed about 350 portraits of them, including 38 of the king. *Portrait of Charles I Hunting*, perhaps the most famous of these works, appears in the PAINTING article. Van Dyck set new standards for English portrait painting through the dignity, elegance, and grace of his interpretations, and his ability to paint clothing and accessories in vivid detail. He established a tradition closely followed by Thomas Gainsborough and Sir Joshua Reynolds, the leading English portrait painters of the 1700's.

Van Dyck created a series of engravings and etchings portraying artists and writers of his day. The portraits in this series, called the *Iconographie*, rank among the masterpieces of printmaking. ROBERT F. REIFF

See also CHARLES (I) of England (picture); CLOTHING (pictures: The Ruff, Clothing of the 1600's).

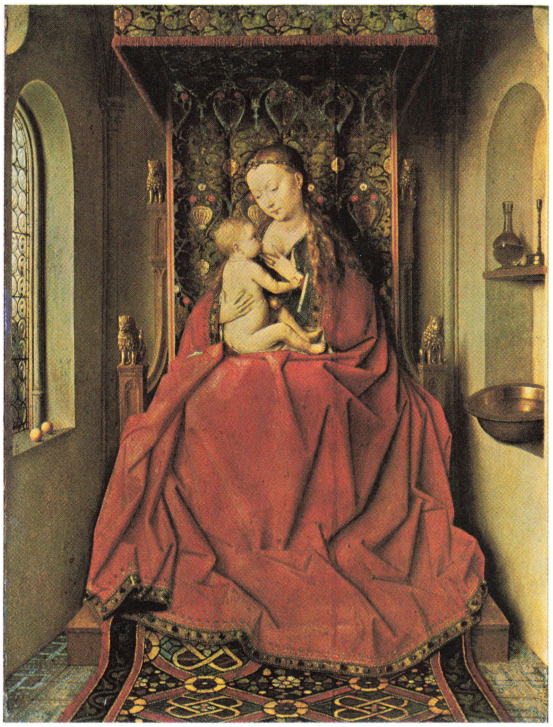
VAN DYKE, HENRY (1852-1933), was an American Presbyterian clergyman, educator, novelist, essayist, poet, and religious writer. His writing is delicate, vivid, and full of idealism, as in his *Companionable Books* (1922). He also wrote *The Poetry of Tennyson* (1889) and many other works. Van Dyke was born in Germantown, Pa. HARRY H. CLARK

VÄNERN. See LAKE VÄNERN.

VAN EYCK, *eyek*, **JAN** (1380?-1441), was one of the founders of the Flemish realistic style of painting. This style dominated northern European painting for more than 100 years. Van Eyck, working with his brother, Hubert, was also the first great artist to use the technique of oil painting.

Van Eyck's style emphasizes natural lighting effects; vivid colors; and rich, precise details of clothing and jewels. His works also show skillful handling of atmosphere and perspective. Van Eyck's paintings reflect the influence of the Flemish painter Robert Campin. Like Campin, Van Eyck used symbolism. For example, in his earliest surviving work, *Madonna in a Church* (1425), Van Eyck painted the Virgin Mary extremely large in comparison to her surroundings. Her size symbolizes her importance to Christianity.

The Van Eyck brothers probably collaborated on the *Ghent Altarpiece* (1432), a huge work consisting of 26 panels in a frame. The artists filled the work with so many figures and symbolic references that the viewer



Oil painting on wood (1435); Städelsches Kunstinstitut, Frankfurt, Germany (Kunst-Dias Blauel)

Van Eyck's *Lucca Madonna* shows the artist's skillful handling of light and his ability to paint fabrics and jewels in precise detail. Van Eyck's realistic style influenced many painters.

must study the altarpiece closely to understand all its meanings.

Van Eyck painted several portrait heads and a famous interior scene, *The Arnolfini Wedding* (1434). This painting shows a couple being married before the artist and his assistant, whose images are reflected in a mirror on the rear wall. *The Arnolfini Wedding* is reproduced in the WORLD BOOK article on PAINTING. Van Eyck was born in the province of Limburg in The Netherlands. ROBERT F. REIFF

See also PAINTING (The Flemish Style).

VAN FLEET, JAMES ALWARD (1892-), an American military leader, trained the armed forces which checked Communist aggression in Greece and Korea. In 1948, President Harry S. Truman sent General Van Fleet to Greece to train and equip the Greek forces. From 1951 to 1953, Van Fleet served in Korea. He commanded the United States Eighth Army, which included ground units contributed by other United Nations members. He helped train 10 South Korean divisions to fight beside other UN troops in Korea.

Van Fleet was born in Coytesville, N.J. He commanded a machine gun battalion in France during World War I. During World War II, he led the Eighth Infantry Regiment of the Fourth Infantry Division in the Normandy landing in 1944. He later commanded the Fourth and Ninetieth Infantry Divisions and the U.S. Third Corps. He retired in 1953 with the rank of general, but was recalled to active duty in 1961 to help train army guerrilla fighters. MAURICE MATLOFF

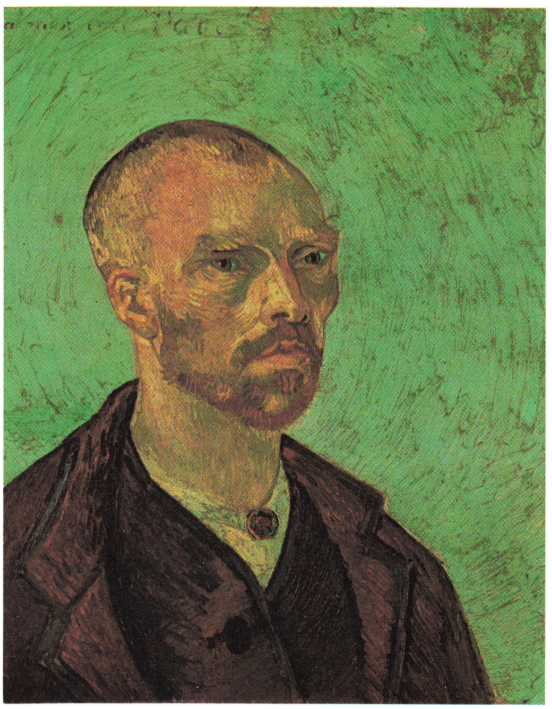
VAN GOGH, VINCENT

VAN GOGH, *van GOH,* **VINCENT** (1853-1890), is one of the most famous painters in modern art. Yet during his lifetime, he received no recognition and sold only one painting. Van Gogh failed in every career he attempted and felt unloved and friendless throughout his life. He turned to art to express his strong religious feelings and his deep need for love and respect. During the last five years of his life, Van Gogh completed more than 800 oil paintings.

Van Gogh was born in Groot-Zundert, near Breda, The Netherlands. When he was 16, his parents sent him to The Hague to work for an uncle who was an art dealer. But Van Gogh was unsuited for a business career.

In 1878, Van Gogh applied for admission to a theological school but was rejected. He then decided to become an unordained preacher and received his training from a missionary society in Brussels, Belgium. Late in 1878, Van Gogh represented the society as a minister in the Borinage, a poor coal-mining district in Belgium. He took his work so seriously that he went without food and other necessities so he could give more to the poor. The missionary society objected to Van Gogh's unorthodox behavior and relieved him in the summer of 1879. Van Gogh began to draw while in the Borinage, and late in 1880 he decided to become a painter.

Van Gogh's first pictures were still lifes and scenes of peasants at work. He favored dark brown and olive colors and heavy brushstrokes. *The Potato Eaters* (1885) is his finest and most ambitious work of this period. In 1886, Van Gogh went to Paris to visit his brother Theo and was immediately attracted to the impres-



Oil painting on canvas; courtesy of the Fogg Art Museum, Harvard University, Cambridge, Mass., Bequest—Collection of Maurice Wertheim

Van Gogh Painted This Self-Portrait in 1888.

sionist art he saw there. Under the influence of impressionism, he lightened his brushstrokes and used bright, clear colors.

In 1888, Van Gogh moved to Arles in southern France. There, he painted his most expressive and original pictures. An example of his work of this period is *Sunflowers*, reproduced in color in the article FLOWER (Flowers in Art). In Arles, Van Gogh suffered from occasional violent seizures, which were diagnosed after his death as epilepsy. The intense color and slashing brushstrokes of Van Gogh's paintings reflect his disturbed mind. An example is his picture *The Night Café*, reproduced in color in the PAINTING article. During a seizure late in 1888, he threatened to kill the French painter Paul Gauguin, who was visiting him. Van Gogh cut off one of his own ears during this seizure. He committed suicide in 1890.

Throughout his life, Van Gogh corresponded with his brother Theo and other people. Van Gogh's *Complete Letters*, published in three volumes in 1958, provide an intimate view of his life and thought. See LETTER WRITING (picture: Some Famous Letters). ROBERT F. REIFF

See also IMPRESSIONISM; EXPRESSIONISM.

VANGUARD. See SPACE TRAVEL (Artificial Satellites).

VAN HISE, CHARLES RICHARD (1857-1918), was an American geologist and educator. He was a member of the United States Geological Survey from 1883 to 1900, specializing on ancient rocks of the Lake Superior region. From 1903 to 1918 he served as president of the University of Wisconsin. His book, *Conservation of Natural Resources in the United States* (1910), was important in this field. Van Hise was born in Fulton, Wis. He taught geology at the University of Wisconsin and at the University of Chicago. CARROLL LANE FENTON

VAN HORNE, SIR WILLIAM CORNELIUS (1843-1915), was a railroad executive of great ability. He became, in turn, general manager, vice-president, and president of the Canadian Pacific Railway. It was mainly his driving force that made possible the prompt construction of that railroad. His executive skill enabled the company to pull through its difficult early years. Van Horne was born near Joliet, Ill. WILLIAM R. WILLOUGHBY

VANIER, GEORGES PHILIAS (1888-1967), served as governor general of Canada from 1959 to 1967. He was the first French-Canadian and the first Roman Catholic to hold the office. Vanier won fame as a soldier and diplomat. He lost a leg while fighting in France in World War I. Later he became a major general. Vanier served as Canadian ambassador to France from 1945 to 1953. He was born in Montreal.

VANILLA is the name of a group of climbing orchids. The vanilla extract which is used to flavor chocolate, ice cream, pastry, and candy comes from these plants. The vanilla vine has been cultivated in Mexico for hundreds of years. This type of vanilla has been introduced into other tropical areas. Madagascar, together with Reunion and the Comoro Islands, now produces over three-fourths of the world's supply. Another variety grows on the island of Tahiti in the South Pacific Ocean.

The vanilla vine has little rootlets by which the plant attaches itself to trees. The cultivated plant lives about 10 years. It produces its first crop after three years.

The plant produces a fruit in the shape of a cylindrical *pod* (bean) from 5 to 10 inches (13 to 25 centimeters) long. The fruit has an oily black pulp that contains many tiny black seeds. The pods are gathered when they are a yellow-green in color. Then the curing, or drying, process takes place. This process shrinks the bean, turns it a rich, chocolate-brown color, and gives it the flavor and aroma of vanilla as we know it.

Vanilla extract is prepared by a complicated and expensive process. The beans are chopped into small pieces and then percolated with alcohol and water. Scientists have developed many substitutes for vanilla flavor because of its high cost. But no imitation product can reproduce the delicate flavor of pure vanilla.

Scientific Classification. Vanilla is in the orchid family, *Orchidaceae*. The vine of Mexico and Madagascar is genus *Vanilla*, species *V. fragrans*. G. W. TAYLOR

Visual Education Service

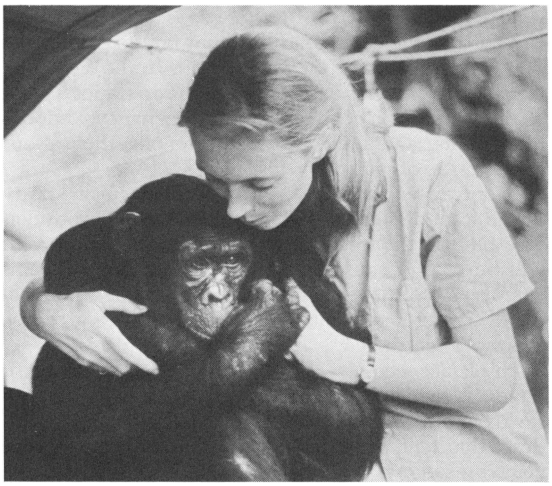
New York Botanical Garden

A Bean of the Vanilla Plant, *above,* **undergoes a drying process and turns chocolate brown. The top photo shows a worker inspecting a wild vanilla vine in Mexico.**

VANITY FAIR. See THACKERAY, WILLIAM M.

VAN LAWICK-GOODALL, JANE (1934-), is an English zoologist who studies the behavior of animals. She became known for her work with chimpanzees.

Van Lawick-Goodall began her research in 1960 on a game reserve in Africa. She won the trust of many chimpanzees through daily contact with them. She observed them at close range and wrote detailed reports of the animals' behavior. She found that chimpanzees often hunt and kill insects and young monkeys and pigs. Scientists previously had thought that chimpanzees ate only fruits and vegetables. Van Lawick-Goodall also discovered that chimpanzees use tools more than any other animal except man. She observed these animals



Baron Hugo van Lawick, © National Geographic Society

Jane van Lawick-Goodall studied the behavior of wild chimpanzees. She won the animals' trust by daily contact with them.

using tree stems as tools for catching termites.

Van Lawick-Goodall was born in London. She earned a Ph.D. from Cambridge University in 1965, even though she had no undergraduate degree. Her writings include *My Friends, the Wild Chimpanzees* (1967) and *In the Shadow of Man* (1971). In *The Innocent Killers* (1971), Van Lawick-Goodall and her husband, Hugo, a photographer, described the behavior of African hyenas, jackals, and wild dogs. JOHN A. WIENS

VAN LEEUWENHOEK, ANTON. See LEEUWENHOEK, ANTON VAN.

VAN LEYDEN, *LIE dun*, **LUCAS** (1494?-1533), a Dutch engraver, was also a painter, draftsman, and designer of woodcuts. He produced an astonishingly large number of works. Born in The Netherlands, he was influenced by the German, Albrecht Dürer, and the Italian, Marcantonio Raimondi. Most of Van Leyden's engravings have Biblical subjects, but some show the life of his time. Among his paintings are *The Last Judgment* and *Moses Striking the Rock*. JULIUS S. HELD

VAN LOON, *van LOHN*, **HENDRIK WILLEM** (1882-1944), an American historian, biographer, journalist, and lecturer, won a 1922 Newbery medal for his history of the world, *The Story of Mankind* (1921). He wrote and illustrated many other works for children, and they were equally popular with grownups. They include *Ships* (1935); *Ancient Man* (1920); *The Story of the Bible* (1923); *Tolerance* (1925); *America* (1927); *Van Loon's Geography* (1932); *The Arts* (1937); *Van Loon's Lives* (1942); and *Thomas Jefferson* (1943).

Van Loon served as a newspaper correspondent in Russia during the Revolution of 1905, in various European countries in 1906 and during World War I. During World War II he wrote material and broadcasted for the United States and for The Netherlands.

Van Loon was born in Rotterdam, The Netherlands, and came to the United States at the age of twenty. He was graduated from Cornell University and from the University of Munich. MERLE CURTI

VAN RENSSELAER, *van REHN suh ler*, was the name of a family of Dutch landowners who settled in New York state.

Kiliaen Van Rensselaer (1595-1643) was one of the leading colonizers of the territory that later became New York. In 1629, the Dutch West India Company authorized large grants of land in New Netherland to company members who promised to colonize their lands. As a result, a class of great landowners, called *patroons*, developed. Kiliaen Van Rensselaer was the greatest of them. He established the huge manor of Rensselaerswyck, which included two counties and part of a third on both banks of the Hudson River south of Albany. Van Rensselaer, a wealthy diamond merchant of Amsterdam, where he was born, was successful because he invested much money and supplied his farmers with cattle, horses, tools, and mills. But he never visited his colony on the Hudson.

Stephen Van Rensselaer (1764-1839), an American army officer and politician, was the eighth and last of the Dutch patroons of Rensselaerswyck. He was lieutenant governor of New York and a U.S. representative. He helped bring about construction of the Erie and Champlain canals. He served as a major general in the War of 1812, and was chancellor of New York University from 1835 to 1839. He was born in New York City. IAN C. C. GRAHAM

VAN'T HOFF, *vahnt HAHF*, **JACOBUS HENRICUS** (1852-1911), was a Dutch chemist who received the first Nobel prize for chemistry in 1901. He discovered the laws of chemical dynamics and osmosis. He was the first to note that the properties of solutions depend upon the number, not the kind, of dissolved particles. He also showed that the simple gas laws apply to dilute solutions. Van't Hoff also did fundamental work in stereochemistry. This branch of chemistry is concerned with the arrangement of atoms in the spaces of the molecules. Van't Hoff was born in Rotterdam. While teaching at the Prussian Academy of Sciences in Berlin, he did important research on the formation and decomposition of double salts. K. L. KAUFMAN

VAN TWILLER, WOUTER. See GOVERNORS ISLAND.

VAN WINKLE, RIP. See RIP VAN WINKLE.

VANZETTI, BARTOLOMEO. See SACCO-VANZETTI CASE.

VAPOR, *VAY pur*, in physics, is the term applied to the gaseous state into which solids and liquids pass when they are heated. In a technical sense, both steam and oxygen are vapors. It is customary, however, to make a distinction between gases and vapors. Gases remain gases when compressed at ordinary temperatures. Vapors resume their liquid or solid state under high pressure at ordinary temperatures. The process of converting a substance from solid or liquid form into a vapor is called *vaporization*. *Evaporation* and *boiling* of liquids are forms of vaporization. In evaporation, the change to a vaporous condition takes place slowly. In boiling, it occurs very rapidly. The formation of vapor directly from a solid state is called *sublimation*. Vaporization in connection with atmospheric conditions bears an important relation to climate. Water vapor is always present in the air. When condensed under varying conditions, water vapor forms clouds, dew, rain, and snow. See also BOILING POINT; EVAPORATION; GAS. LOUIS MARICK

VAPOR LAMP is a source of electric light that uses a vapor or gas, rather than a wire, to produce light. The

first vapor lamp consisted of a tube filled with vapor and a small pool of mercury at one end. When the tube was tipped, the mercury rolled through the gas, causing it to glow. Modern vapor lamps are rather short and stocky. They are used outdoors for street and highway lighting. A short quartz tube inside a larger glass tube causes the gas between them to glow. Different gases give various colors. For example, sodium gives yellow or orange light. Fluorescent lights are a form of vapor lamp. See also ELECTRIC LIGHT. KARL A. STALEY

VAPOR LOCK occurs in a gasoline engine when some of the gasoline boils in the fuel-supply system. Excessive heating of the engine may cause boiling, or *vaporization*, of the fuel. This reduces the amount of fuel pumped to the engine, because vapor takes up more space than liquid. The engine then runs erratically or stops until the vaporized gasoline cools and turns to liquid. Vapor locks occur most frequently during long, steep climbs on hot days, or when slowing suddenly after a hard drive. WILLARD L. ROGERS

See also FUEL INJECTION.

VAPOR TRAIL. See CONTRAIL.

VARA. See WEIGHTS AND MEASURES (Miscellaneous Weights and Measures).

VARANGIAN. See VIKING (The Swedish Vikings).

VARDAMAN, JAMES KIMBLE (1861-1930), a Mississippi Democrat, served as governor from 1904 to 1908 and as a United States senator from 1913 to 1919. As governor, Vardaman stopped the practice of leasing state convicts to work for corporations and individuals. As a senator, he opposed the United States' entry into World War I, and was one of six senators who voted against the declaration of war on Germany in 1917. Vardaman was born near Edna, Tex., and moved to Mississippi in 1868. CHARLOTTE CAPERS

VARGAS, *VAHR gus*, **GETÚLIO DORNELLAS** (1883-1954), served as president of Brazil from 1930 to 1945 and from 1950 to 1954. He was the governor of Rio Grande do Sul for two years before he seized the presidency in 1930 with a group of reforming army officers. Vargas was forced out by an army ultimatum in 1945, but he was elected president again in 1950. He was born in São Borja on April 19, 1883. He committed suicide when the army demanded his resignation again in 1954. HAROLD E. DAVIS

See also BRAZIL (History; picture).

VARIABLE STAR. See STAR (Variable Stars).

VARIATION. See EVOLUTION (Variation and Change; The Cause of Variations); COMPASS (Variation).

VARIATIONS, in music, consist of repeating some elements of a musical idea while altering others. This technique is the principle behind the development of musical ideas, and gives variety while retaining coherence.

Composers of all periods have freely used the variation technique. Early variations used by classic composers usually repeated the melody clearly, changing the accompaniment and sometimes the harmonies. Variations became more complicated in the romantic music of the 1800's. In this and later music, it is often difficult to see any resemblance between variations and the original theme. GRANT FLETCHER

See also MUSIC (Variation Form).

VARICELLA. See CHICKEN POX.

VARICOSE VEIN, *VAR ih kohs*, is a swollen vein caused by some body condition that interferes with the flow of blood toward the heart. Veins in the legs often become varicose, especially when a person stands a great deal. Heart and liver diseases, gout, pregnancy, abdominal tumors, and tight garters are among the various other causes of varicose veins.

In advanced cases of varicose veins, bluish knotty lumps form along the vein. The patient feels considerable pain in the leg. The chief danger is that the vein will burst, and cause hemorrhage. The diseased veins can also keep the tissues from getting enough nourishment. Water may collect under the skin and cause dropsy. Then the leg is likely to develop ulcers.

Physicians recommend wearing an elastic stocking or bandage, which will support the varicose vein with steady pressure. Physicians often inject the veins with drugs that tend to shrink them or they may remove the veins by surgery. A disorder known as *piles* is varicose veins of the rectum. HYMAN S. RUBINSTEIN

See also HEMORRHOID.

VARIETY MEATS. See MEAT.

VARIOMETER. See GLIDER.

VARNA, *VAHR nah* (pop. 180,062), formerly STALIN, is a Black Sea port in Bulgaria. It lies about 120 miles (193 kilometers) southeast of Bucharest. For location, see BULGARIA (color map). The city manufactures metal, textile, leather, and tobacco products. It is a commercial fishing center, the home of a naval academy, and a summer-resort area. IRWIN T. SANDERS

VARNISH is a transparent liquid used to protect wood, metal, and other materials from air and moisture, and to improve their appearance. A varnish leaves a hard, glossy film when it dries.

Clear varnishes protect the surface of wood while allowing the natural grain of the wood to show through. *Varnish stains* contain dyes that change the color of the wood but still bring out the grain. Varnishes used on metal are sometimes called lacquers. Lacquers help prevent corrosion without dulling the metallic appearance. Varnishes are also used to protect insulating wires, masonry, and paper from moisture.

Varnishes can be baked on by heating the varnished articles in ovens at temperatures of 150° to 400° F. (66° to 200° C). Baking improves the wearing quality of the varnished object.

Types of Varnish. There are two main classes of varnishes, spirit and oleoresinous. *Spirit varnishes* are made of chemicals called *resins*. The resins are dissolved in a quickly-evaporating solvent such as alcohol. These varnishes dry when the solvent evaporates. Shellac is a common spirit varnish. Other examples of spirit varnishes include Japan, dammar, and pyroxylin lacquers.

Oleoresinous varnishes are mixtures of resins and drying oils that are heated and dissolved in turpentine or petroleum products. These varnishes dry in two ways, by evaporation of the solvent, and by the hardening of the resin-oil mixture when it combines with oxygen. Oleoresinous varnishes withstand outdoor conditions well. Spar varnish, used on the wood exterior of boats, is an oleoresinous varnish.

Making Varnish. Both natural resins and synthetic resins are used in making varnish. *Natural resins* are extracted from living plants and from fossil plants. Shel-

lac, dammar, and rosin are common natural resins. *Synthetic resins* include such chemical compounds as phenol-formaldehyde, urea-formaldehyde, alkyd (glyceryl phthalate), and cumar.

In making spirit varnishes, the resin is dissolved by churning it with the solvent. Small amounts of heat are sometimes used to speed the dissolving process. After the resin is dissolved, the varnish is refined by filtering and is then ready for use.

In making oleoresinous varnishes, the oil and resin are cooked in closed kettles that hold 5,000 gallons (19,000 liters) or more. The mixture is kept at a temperature of 450° to 700° F. (230° to 370° C) until it reaches the desired *body* (thickness). Then the mixture is cooled and thinners are added. Some natural resins will not dissolve easily in oils. These resins are *run* (heated at about 600° F., or 320° C, until 15 to 30 per cent evaporates).

Drying oils are added to the varnish to hasten the drying time. Linseed oil was probably the first oil to be used in varnishes. Many other drying oils are used today, such as, perilla, tung, dehydrated castor, soybean, and fish oils. Compounds of lead, cobalt, or manganese are often added to quicken drying.

Varnishes are named by giving the number of gallons of oil that have been mixed with 100 pounds of resin. For example, a 30-gallon tung-oil kauri varnish is made with 30 gallons of tung oil and 100 pounds of kauri resin. Varnishes used on surfaces exposed to weather contain more oil than those used indoors. JOHN R. KOCH

See also LACQUER; SHELLAC; RESIN; AIRBRUSH.

VARVE. See ARCHAEOLOGY (Absolute Chronology).

VASA, HOUSE OF. See GUSTAVUS.

VASCO DA GAMA. See DA GAMA, VASCO.

VASCULAR SYSTEM is the complete circulation system of the body which carries all the fluids, including the blood, the lymph, and chyle. It is made up of the heart, arteries, veins, capillaries, and lymphatics.

In plants, the vascular system consists of tube-like cells that carry water and food throughout the plant.

See also BLOOD; CIRCULATION; also the Trans-Vision three-dimensional color picture with HUMAN BODY.

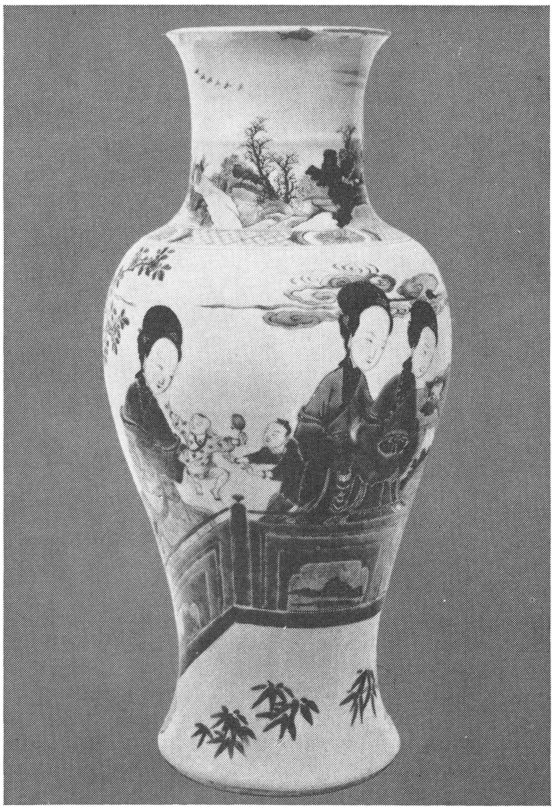
VASE, *vays*, or *vayz;* in Great Britain, often *vahs*, or *vahz*. A vase is a hollow vessel of pottery, stone, metal, glass, or other material. It is usually rounded and deeper than it is wide. A vase is generally decorative, or ornamental, and designed to please the eye by its graceful shape, color, or patterns applied on its surface. Vases are now used chiefly for ornament or to hold flowers. Sometimes they are used for other household purposes. Vases also hold the ashes of the cremated dead.

Pottery or earthenware vases have been made in almost every age of the world's history. Many relics have been preserved and new ones are constantly being discovered. Pictures on these relics often reveal the artistry of the people and sometimes something of their life. One of the most famous ancient vases is the Portland vase, found near Rome in the 1600's. It was found in a tomb believed to be that of Alexander Severus. The Portland vase is of transparent dark blue, coated with milky-white glass cut in cameo style. It is located in the British Museum. EUGENE F. BUNKER, JR.

See also GLASSWARE (pictures); PORCELAIN (pictures).

VASECTOMY. See BIRTH CONTROL.

VASELINE. See PETROLATUM.



Metropolitan Museum of Art

This Chinese Vase Was Made in the Early 1700's.

VASHTI. See ESTHER.

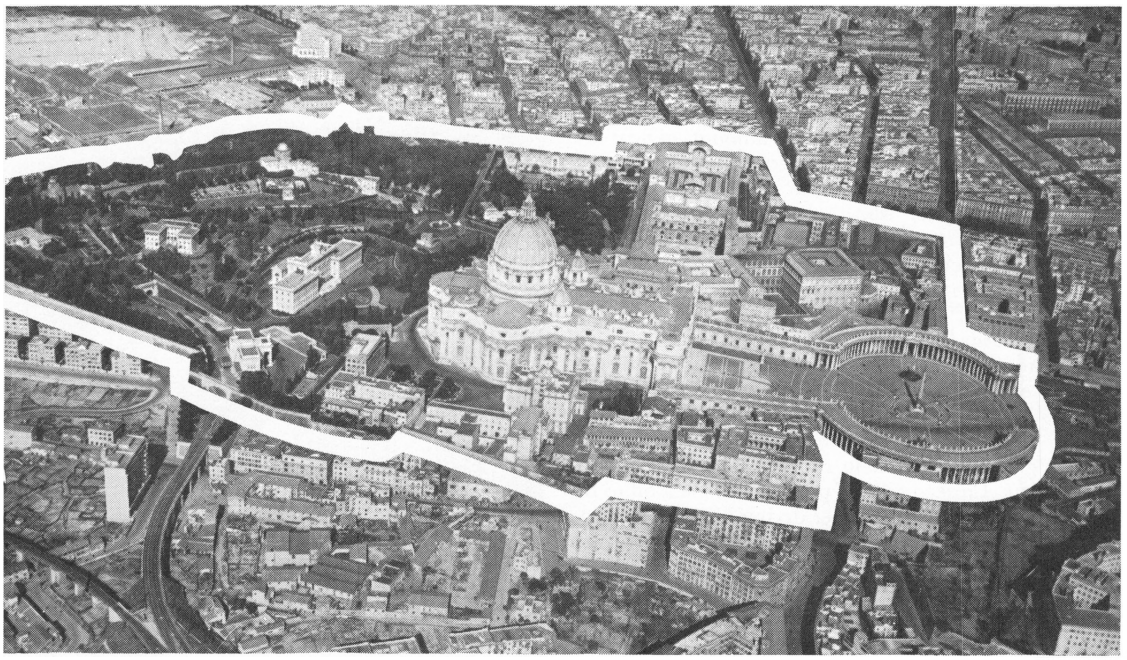
VASODILATOR NERVES. See BLUSHING.

VÁSQUEZ DE CORONADO, FRANCISCO. See CORONADO, FRANCISCO VÁSQUEZ DE.

VASSAL. See FEUDALISM.

VASSAR, MATTHEW (1792-1868), was an American brewer who founded Vassar College. He was born in East Tuddingham, England, and was brought to the United States in 1796. He established a successful brewery in Poughkeepsie, N.Y., and made a large fortune. He also owned a whaling dock in Poughkeepsie, and was part owner of a whaling fleet. Vassar became interested in higher education for women, and in 1861 gave a large sum of money to found Vassar College. The wide publicity given to the venture created interest in college education for women throughout the world. Gifts by Vassar to the college during his life totaled over $800,000. Vassar became a coeducational college in 1969. ROBERT H. BREMNER

VASSAR COLLEGE is a coeducational liberal arts college at Poughkeepsie, N.Y. It is privately controlled and offers courses in languages and literature, arts, physical sciences, and social sciences. Vassar students live in 10 campus residence houses on a 950-acre (384-hectare) campus. Vassar was founded as a school for women in 1861. It was the first women's college to have the equipment and resources equal to those of men's colleges. It became a coeducational school in 1969. For enrollment, see UNIVERSITIES AND COLLEGES (table). See also VASSAR, MATTHEW. SARAH GIBSON BLANDING



Wide World

The Boundaries of Vatican City, marked by a white line in this picture, enclose an area of about 1/6 square mile (0.4 square kilometer) in northwestern Rome. The dome of the famous Saint Peter's Church dominates the skyline of the Papal State.

VATICAN CITY, *VAT ih kuhn* (pop. 1,000), is the smallest independent state in the world. It serves as the spiritual and governmental center of the Roman Catholic Church, the largest Christian church in the world. Vatican City covers only 108.7 acres (44 hectares). But it exercises spiritual sway over millions of Roman Catholics. Its ruler is the pope. Vatican City lies entirely within the city of Rome, Italy. But it is foreign soil to Italian citizens. Vatican City has been an independent sovereign state since the signing of the Treaty of the Lateran in 1929. For location, see ITALY (political map); ROME (map: Inner Rome).

The official name of Vatican City in Italian is STATO DELLA CITTÀ DEL VATICANO (The State of Vatican City). *The Vatican* is a short name for the state as a whole, and also for the city that makes up the state. People often use the term *Vatican* to refer to the pope and the government of Vatican City, in much the same way as they use the term *Washington* to refer to the U.S. President and his administration.

Description

Vatican City is about as large as an average city park. It lies on Vatican Hill in northwestern Rome, just west of the Tiber River. High stone walls surround most of the city. The irregularly-shaped area within these walls contains picturesque buildings in several architectural styles. It also contains many courtyards, landscaped gardens, and quiet streets. The huge St. Peter's Church, with its stately dome, dominates the entire city.

St. Peter's Church is the largest Christian church in the world. Contrary to popular belief, it is a basilica, not a cathedral. St. John Lateran, in Rome, is the cathedral church of the pope (see BASILICA; CATHEDRAL; LATERAN). For a history and description of St. Peter's Church and St. Peter's Square, see SAINT PETER'S CHURCH.

Vatican Palace is a group of connected buildings with well over 1,000 rooms. The various chapels, apartments, museums, and other rooms cluster around several open courts. The pope's apartment, the offices of the Secretariate of State, and reception rooms and halls occupy one part of the palace. The remainder is devoted largely to the Vatican Museums, the Vatican Archive, and the Vatican Library.

Vatican Museums have a priceless collection of statuary, including the famous *Apollo Belvedere* and the *Laocoön* (see the pictures in the articles on APOLLO and LAOCOÖN). The museums also have large sections devoted to pagan and Christian inscriptions, to Egyptian and Etruscan antiquities, and to modern religious art. The many rooms and chapels within the museums are decorated by the works of such master artists as Fra Angelico, Pinturiccio, Raphael, Titian, and Leonardo da Vinci. Some of Michelangelo's greatest paintings decorate the ceiling and one large wall of the Sistine Chapel (see MICHELANGELO; SISTINE CHAPEL).

Vatican Archive contains important religious and historical documents. Pope Paul V organized the archive in 1612. It houses such important documents as the original report on the trial of Galileo (1633), the request of the English Parliament for the annulment of the marriage of Henry VIII to Catherine of Aragon (1530), and the concordat of Napoleon (1801). Pope Leo XIII opened the archive to scholars in 1881. Since then, many European nations have created historical institutes to search the archives for information on their particular countries.

Vatican Library has one of the world's largest and most valuable collections of early manuscripts and books. See VATICAN LIBRARY.

Other Buildings belonging to Vatican City but located outside the city walls include the basilicas of St. John Lateran, St. Paul's-outside-the-Walls, and St. Mary Major, all in Rome; and the pope's summer villa and the Vatican observatory at Castel Gandolfo.

Administration

The pope, as absolute ruler of Vatican City, heads all branches of the government. But, since he devotes his time primarily to spiritual and ecclesiastical matters, he delegates most of his temporal authority to other officials.

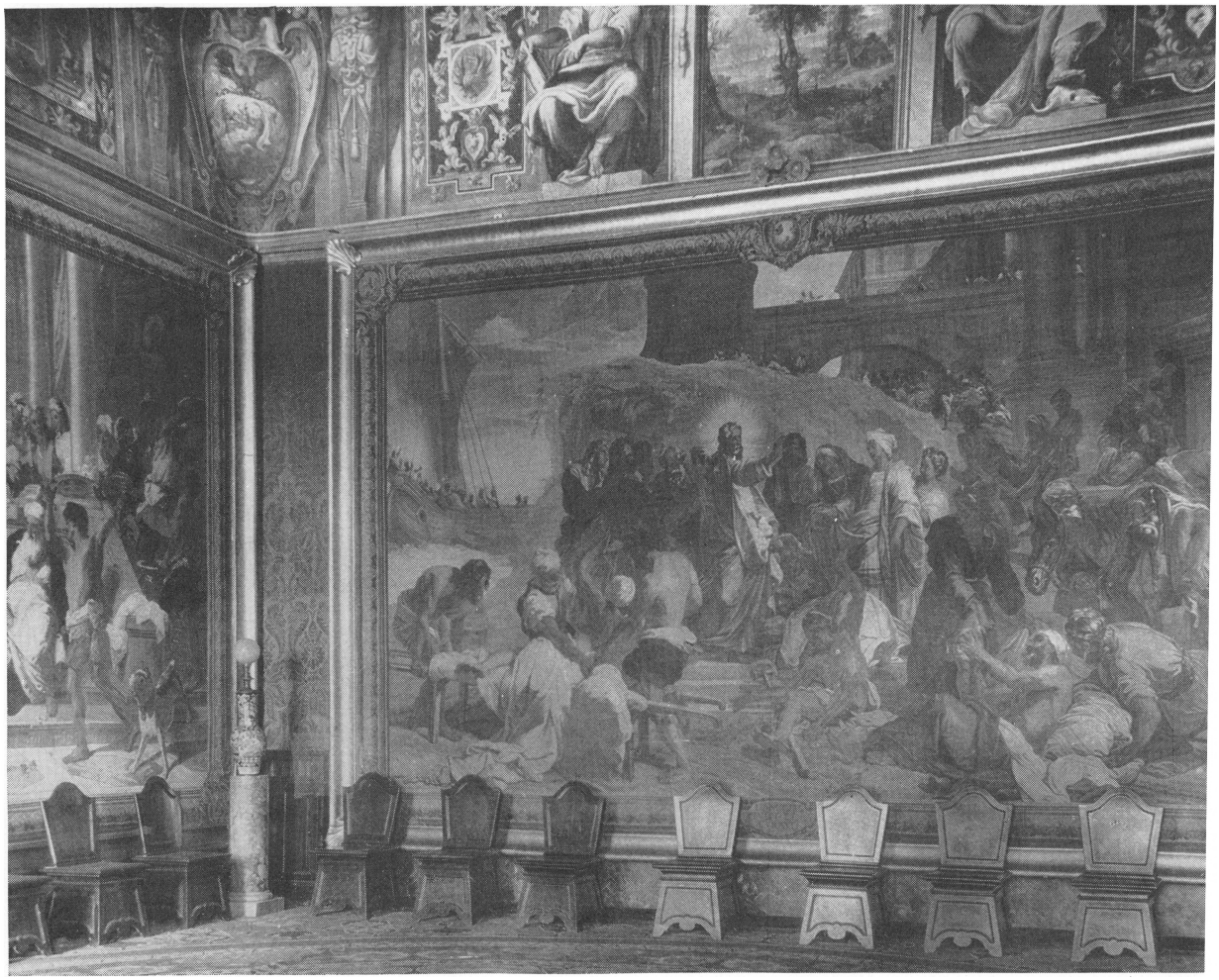
The internal domestic affairs of Vatican City are directed by a Governor, whose duties resemble those of the mayor of a city. Foreign affairs are handled by the Cardinal Secretary of State, who also coordinates ecclesiastical and political affairs. The Vatican has civil law courts in addition to the Tribunal of the Sacred Roman Rota, which handles religious cases. But most civil criminal cases are prosecuted by the Italian government. The Congregation of the Ceremonial directs papal ceremonies and audiences, and also handles matters of protocol and etiquette. Vatican finances are controlled by a number of administrations, or departments. Each administration handles a different set of funds.

Vatican City issues its own postage stamps, coins, and automobile license plates. The pope's yellow-and-white banner is the official state flag (see FLAG [color picture, Flags of Europe]).

Public Works. The Vatican maintains its own mail system, telephone and telegraph systems, water supply, and lighting and street-cleaning services. It also has its own bank, a large printing plant, and a rarely occupied jail. Although the state has its own railroad station, no one has ever bought a ticket to Vatican City. The 300 yards (270 meters) of track that connect the station with an Italian railroad carries only freight.

Armed Forces. Vatican City does not have an army or navy capable of fighting a war. But it does have its own "armed forces." The most famous of these are the Swiss Guards, who protect the pope and serve as sentries. Their yellow, orange, and blue uniforms are said to have been designed by Michelangelo or Raphael

The Assembly Hall of Cardinals, in the Vatican Palace, Is Richly Decorated with Paintings and Carvings.
W. Bosshard, Black Star



(see SWISS GUARDS). Other armed forces include the Noble Guards (bodyguards and escorts of the pope); the Palatine Guards (the pope's militia); and the Pontifical Gendarmery (the pope's police force).

Diplomatic Corps of Vatican City includes about 60 *legates* (ambassadors), as well as other diplomatic personnel. The highest ranking legates are the *nuncios*. Legates of lesser rank are called *internuncios*. Nuncios and internuncios head the Vatican's delegations to other countries. They also look after the welfare of the Roman Catholic Church in those countries. Most European and Latin-American countries receive nuncios or internuncios from the Vatican. Papal representatives in countries that have no formal diplomatic relations with the Vatican are called *apostolic delegates*. Such delegates have no diplomatic status and hold authority only in ecclesiastical matters. Apostolic delegates serve in the U.S., Canada, Great Britain, Mexico, and several other countries. See LEGATE; NUNCIO.

Communications. The Vatican publishes *L'Osservatore Romano*, one of the most influential daily newspapers in the world. Other Vatican publications include *Osservatore della Domenica*, a weekly publication; and the *Acta Apostolicae Sedis*, which prints official church documents. The Vatican's powerful radio transmitter broadcasts news and papal messages in 30 languages, including Latin.

History

Vatican Hill was once the site of Roman emperor Nero's public gardens and circus. Many early Christians suffered martyrdom there. According to tradition, St. Peter was crucified on the hill and buried nearby. The early popes believed that a shrine built in the A.D. 100's marked the site of Peter's tomb. Because of this belief, they erected Vatican City on that spot.

In the A.D. 300's, the Christian emperor Constantine the Great built a basilica over the tomb in which St. Peter was believed to be buried. The Vatican Palace and other structures were gradually built around the basilica. But the main residence of the popes during the Middle Ages was the Lateran Palace in Rome, not the Vatican. From 1309 to 1377, the popes lived at Avignon, France. On their return to Rome, they found the Lateran Palace badly burned, so they moved to the Vatican Palace. Beginning in the 1500's, St. Peter's Church was built on the site of the Old Basilica of Constantine.

Through the years, the popes gained control over an area in central Italy called the Papal States. In 1870, after a series of political defeats, Pope Pius IX lost his power over the Papal States. In protest, he and his successors withdrew inside the Vatican and refused to deal with the Italian government. Finally, in 1929, the Treaty of the Lateran was signed. By this treaty, the pope gave up all claim to the Papal States, and Italy agreed to the establishment of the independent State of Vatican City. For the provisions of the Treaty of the Lateran, see PAPAL STATES.

In 1939, Pope Pius XII initiated a series of excavations beneath St. Peter's Church. These excavations unearthed, among other things, a tomb thought to be the original tomb of St. Peter. JOACHIM SMET

See also POPE; ROMAN CATHOLIC CHURCH.

The Square of Saint Peter's Church, Which Is the Largest and Most Famous Church in the Christian World.
United Press Int.

VATICAN COUNCIL is the name of two *ecumenical* (general) councils of the Roman Catholic Church that were held in Vatican City in Rome. An ecumenical council is a meeting of church leaders called by a pope for a special purpose. There have been 21 ecumenical councils.

The first Christian council, the Council of Nicaea, took place in 325. The 20th and 21st councils are called *Vatican Councils* I and II. Vatican I was held in 1869 and 1870. Vatican II was held from 1962 to 1965. This article describes the Vatican councils. For background information on these councils see ROMAN CATHOLIC CHURCH. For information on earlier councils, see NICENE COUNCILS; TRENT, COUNCIL OF.

Vatican I

Vatican I was called by Pope Pius IX. It opened Dec. 8, 1869, and is remembered primarily for approving the doctrine of *papal infallibility*. This doctrine states that the pope can commit no error when he speaks as head of the church to proclaim, in matters of faith and morals, what is to be accepted by all Roman Catholics as the teaching laid down by Jesus Christ and His apostles. At the outbreak of the Franco-Prussian War in 1870, the council was suspended. It never reconvened.

Vatican II

Pope John XXIII announced his intention of calling a worldwide church council on Jan. 25, 1959. He said the council would provide an *aggiornamento* (renewal or updating) of Roman Catholic religious life and doctrine.

Pope John opened the first session Oct. 11, 1962, and closed it Dec. 8, 1962. He died on June 3, 1963, and the remaining three sessions were held under his successor Pope Paul VI. The second session ran from Sept. 29 to Dec. 4, 1963; the third session from Sept. 14 to Nov. 21, 1964; and the final session from Sept. 14 to Dec. 8, 1965.

Vatican II was one of the most widely-discussed religious events of the century. Religious officials, journalists, and other observers—both Catholic and non-Catholic—from all over the world reported and interpreted the actions of the council.

The Documents. The council *promulgated* (officially announced) 16 documents. The documents defined the nature of the church, gave the bishops greater influence in church affairs, and gave laymen a more active part in the liturgy. The documents also proclaimed a historic church position on religious liberty, and expressed new and liberalized positions on the church's relations with non-Catholic and non-Christian faiths.

The council approved these documents in the form of four *constitutions*, three *declarations*, and nine *decrees*. Constitutions were the council's most solemn documents.

The Constitution on the Church was the most important of the documents. It set the theological basis for all other council documents, and described the nature of the church. It described the laity and hierarchy as "members of the people of God," and forbade any separation between them. The constitution portrayed the bishops and the pope as a "college," with the pope as head. It implied a greater sharing by the bishops in the exercise of the authority of the church and gave the bishops a larger role in church government.

The Constitution on the Sacred Liturgy permitted the use of the *vernacular* (local language) in place of Latin in parts of the Mass. The Mass liturgy was revised to allow greater participation by the congregation. The vernacular was also approved for other sacraments, such as baptism, eucharist, and marriage.

The Constitution on Divine Revelation emphasized the vital part sacred scriptures (the Bible) play in the church's life and liturgy. By stressing the importance of the Bible, this constitution narrowed the differences between Roman Catholics and Protestants on the issue of divine revelation.

The Pastoral Constitution on the Church in the Modern World was the first ecumenical document to be addressed to all men, not just Roman Catholics. The first part discussed man's relationship to the world, to the church, and to God. The church rejected atheism, but said that atheists should be respected and loved because they are God's creatures.

The second part took up urgent problems facing mankind. One chapter dealt with family life, and others dealt with social, economic, and political problems of today. The council condemned all forms of war as a means of settling international disputes, but it said countries had the right to self-defense. It called for the community of nations to organize and work to relieve the suffering of poor and starving peoples.

The Declaration on Christian Education endorsed the right of parents to choose freely the type of education they wish for their children.

The Declaration on the Relationship of the Church to Non-Christian Religions emphasized the respect owed to all men as sons of a common Creator. The document said the church rejects nothing that is "true and holy" in religions such as Hinduism, Buddhism, Islam, and Judaism. The declaration condemned any form of discrimination, particularly anti-Semitism. It stated the Jews had no collective responsibility for the death of Christ.

The Declaration on Religious Freedom stated that all men have the right to religious freedom. This was a dramatic change in the church's historical position. The declaration, however, repeated the church's claim to be the one true faith.

The Decree on the Instruments of Social Communication declared that means of communication such as the press and motion pictures should be used for moral purposes.

The Decree on Ecumenism pledged the church to work for the unity of all Christianity, and encouraged Roman Catholics to participate in the ecumenical movement. The decree permits Catholics to join non-Catholics in common prayer, with the permission of local bishops.

The Decree on Eastern Catholic Churches reasserted the equality of Eastern Rite Catholic churches with the Western Latin rite. The decree set forth circumstances under which Catholics and Eastern Orthodox Church members could participate together in the sacraments and liturgy.

The Decree on the Bishops' Pastoral Office in the Church discussed in detail the collegiality of bishops described in the *Constitution on the Church*. It directed the bishops to form national and regional conferences to meet local conditions and problems. The document called for a

synod of bishops to meet with the pope periodically in Rome to act as an international senate or advisory board.

The Decree on the Appropriate Renewal of the Religious Life gave directions for modernizing the religious life of monks, priests, brothers, and nuns.

The Decree on Priestly Formation urged reforms in both the intellectual and spiritual training of candidates for the priesthood. It granted national church leaders more authority to regulate seminaries.

The Decree on the Ministry and Life of Priests reaffirmed the laws of *celibacy* (unmarried state) for Roman Catholic priests, without modifying the Eastern Rite discipline allowing married or celibate clergy.

The Decree on the Apostolate of the Laity expanded the examination of the role of Catholic laymen in church affairs described in the *Constitution on the Church.* The decree urged the laity to use its initiative in both religious and temporal affairs.

The Decree on the Church's Missionary Activity called for greater cooperation and support between well-established churches and missionary churches.

Other Events. On Oct. 4, 1965, Pope Paul made a historic journey to speak before the United Nations in New York City. The pope made the trip in the name of the entire council "for the cause of peace in the world." He pleaded for the support of all nations in promoting peace and outlawing war.

The final days of the council witnessed two other historically significant events. On December 6, Pope Paul met with Protestant observers of the council and more than 1,000 bishops in a joint prayer service.

On December 7, the pope read a declaration removing a sentence of excommunication on the patriarch of Constantinople that dated back to 1054. A similar declaration read in Istanbul by the patriarch of Constantinople removed a sentence of excommunication passed against a group of papal legates in 1054. The declarations were a step toward ending the division between the Roman Catholic and Eastern Orthodox churches. MARK J. HURLEY

VATICAN LIBRARY is the library of the Roman Catholic Church in Vatican City. It has one of the world's most important collections of early manuscripts and books. The Vatican Library was founded by Nicholas V, pope from 1447 to 1455, as a library for handwritten manuscripts. It is still chiefly a manuscript library, though it now also has about 350,000 printed books in its collection. The library's manuscripts number more than 50,000, over 31,000 of which are valuable old Latin works. There are also nearly 4,000 Greek and Oriental manuscripts in the library.

Many of the manuscripts are kept in closed rooms and may be seen only with the permission of the librarian. But the current practice of the Vatican Library is to make such materials available to all competent scholars. FULTON J. SHEEN

See also LIBRARY (picture: Vatican Library).

VÄTTERN, LAKE. See SWEDEN (Swedish Lowland).

VAUBAN, SEBASTIEN LE PRESTRE (1633-1707), MARQUIS DE VAUBAN, best known as a French military engineer, was equally brilliant as a statesman and economist. He was an outstanding military and state adviser of Louis XIV. He contributed to the sciences of fortification and siegecraft. Vauban courageously advised against the renewed persecution of Protestants and proposed badly needed economic reforms, but Louis XIV lacked the wisdom to take his advice. Vauban was born in Saint Léger de Fourgeret. WILLIAM BARK

VAUDEVILLE, *VAW duh vil,* is a form of entertainment made up of music, singing, dancing, and other performances, which are given in a series of short, independent acts. The term *vaudeville* originated in France. It is believed to have been applied to drinking songs written by a man in Vire in the Vaux de Vire, a valley of Normandy.

At first, vaudeville served simply as a separate entertainment added to the regular drama. It was usually music and dancing between acts of the play. In England and in the United States, a similar form of entertainment known as the *varieties* developed. It was given in theaters called *variety halls.*

In 1883, Benjamin Keith opened in Boston the first American vaudeville house, the Gaiety Museum. Another important early vaudeville house was Tony Pastor's in New York City. Around 1900, several large *chains* (circuits) of vaudeville theaters came into existence and achieved great popularity. The principal chains of theaters were the Keith-Albee and the Orpheum circuits. With the arrival of sound motion pictures in 1927, vaudeville began to decline. But vaudeville performers became popular in nightclubs, and also on radio and television variety shows. GLENN HUGHES

VAUGHAN, HENRY (1622-1695), was one of the leading English poets of the 1600's. He began his career with a volume of nonreligious verse, *Poems* (1646), and then wrote the deeply religious *Silex Scintillans* (two parts, 1651 and 1655). The Latin *Silex Scintillans* means "the flashing flint," and refers to the way God's love and a knowledge of divine mysteries can strike fire into the stoniest hearts of men. Vaughan described these moments of illumination with fine natural imagery. His greatest poem, "The World," is a complex meditation that tells how he "saw Eternity the other night." He is often considered the forerunner of the romantic poet William Wordsworth.

Vaughan was born in Wales. He retired there about 1660 and became a country doctor. RICHARD S. SYLVESTER

See also METAPHYSICAL POETS.

VAUGHAN WILLIAMS, *VAWN WIL yumz,* **RALPH** (1872-1958), was one of Great Britain's foremost composers. His music mingles the flavors of English folk songs and Tudor church music, both of which he studied intensively. He produced such distinguished music as the *Sixth Symphony* (1947); an opera, *The Pilgrim's Progress* (1951); *Seventh Symphony,* or *Sinfonia Antarctica* (1952); and *Eighth Symphony* (1956). Vaughan Williams composed music for the coronation of Queen Elizabeth II in 1953.

In 1904, Vaughan Williams became active in the Folk Song Society, and edited *The English Hymnal* in 1905. By 1914, he had written *A Sea Symphony* (1910), *A London Symphony* (1914), and several other choral and orchestral works. Some of his other popular works include *The Lark Ascending* (1921), *Sir John in Love* (1929), and *Flourish for a Coronation* (1937).

Vaughan Williams was born in the parish of Down Ampney, Gloucestershire. HALSEY STEVENS

VAULT, *vawlt*, in architecture, is a roof or ceiling in the form of an arch. The four main kinds of vaults are the barrel vault, the dome, the groined vault, and the ribbed, or Gothic, vault. The simplest form is the *barrel vault*, which is a continuous arch. Each part is held in place by the part next to it. The *dome* is a vault in the form of a hemisphere built upon a circular base. Some domes are oval or slightly pointed. The *groined vault* is formed by joining together two or more barrel vaults at right angles. The lines at which the vaults join are called *groins*. In a *ribbed vault*, arched ribs are built in the places where groins would otherwise be. The ribs rest on pillars and make massive walls unnecessary. In Gothic architecture, ribs were both structural and decorative.

The word *vault* also applies to rooms designed for the safekeeping of valuables. Such a vault is usually made of steel, with heavy walls and ceiling, and it is entered through a steel door. In bank vaults, such a door generally has complicated and delicate locking and burglar alarm systems. See BANKS AND BANKING (picture).

In cemeteries, certain enclosures or buildings of stone or metal are called vaults. They are used as temporary or permanent places of burial. TALBOT HAMLIN

VEAL is the flesh of cattle that are too young and small to be sold as beef. These cattle are divided into *vealers* and *calves*. Vealers are animals under 12 weeks old that are fed with milk. Although calves eat grass or grain like older cattle, calf flesh is not as tasty as beef.

In the United States, vealers and calves sell by weight and according to grades set up by the federal government. The U.S. grades are *prime*, *choice*, *good*, *standard*, *utility*, and *cull*. The best grades of veal are plump, and range in color from light pink to light gray. The flesh of lower grades is thin and watery.

Calf flesh is darker and has more definite grain than vealer flesh. Calves also have much more fat covering than vealers. The meat of both calves and vealers has little trimming waste when sold in stores.

Veal is similar to beef. Veal contains more water than beef, but it has less fat. Veal is more tender than beef, but the older age of beef makes it tastier than veal. People in the United States eat much more beef than veal. Americans average about 110 pounds (50 kilograms) of beef per person per year compared with about $2\frac{1}{2}$ pounds (1.1 kilograms) of veal. JOHN C. AYRES

See also BEEF; CATTLE (Beef Cattle); MEAT.

VEBLEN, *VEB lun*, **THORSTEIN BUNDE** (1857-1929), an American economist, was one of the most original and creative thinkers in the history of American economic thought. His first book, *The Theory of the Leisure Class* (1899), is a scholarly and satirical protest against the false values and social waste of the upper classes. *The Theory of Business Enterprise* (1904) criticizes the capitalist system, and predicts that it will drift into either fascism or socialism. In *The Engineers and the Price System* (1921), Veblen assigned to scientists and engineers an important position in building a new planned economic society. Veblen was born in Cato, Wis. He was graduated from Carleton College and received his Ph.D. from Yale University. DUDLEY DILLARD

VECELLI, TIZIANO. See TITIAN.

VECTOR. See MOTION (Newton's Laws of Motion).

VEDAS, *VAY duhz*, are the oldest sacred books of Hinduism. The Vedas include most of the doctrines concerning Hindu divinities. They also present philosophical ideas about the nature of Brahman, the supreme divine being of the Hindu religion. The word *veda* means *knowledge*.

There are four Vedas. They are, in order of age beginning with the oldest, *Rig-Veda*, *Sama-Veda*, *Yajur-Veda*, and the *Atharva-Veda*. Each Veda is divided into three parts: (1) the *Samhitas*, consisting of hymns and prayers written in verse; (2) the *Brahmanas*, dealing mainly with ideas about Brahman and with religious ceremonies; and (3) the *Upanishads*, philosophical works.

The Vedas were composed during the 1,000 years before the birth of Christ. For hundreds of years, certain Hindu families memorized parts of the Vedas and passed them down orally. Hindu law permitted only certain persons to hear the Vedas recited, and so the works became surrounded by mystery. Nevertheless, the ideas presented in the Vedas spread throughout Indian culture. The Vedas were probably first put in writing about the time of Christ's birth. CHARLES S. J. WHITE

See also BRAHMAN; HINDUISM; SANSKRIT LANGUAGE AND LITERATURE; UPANISHADS.

VEERY, *VEER ih*, is a bird that belongs to the thrush family. It lives in the northeastern parts of the United States and Canada. The veery is also known as Wilson's thrush or as the nightingale. It has brownish upper parts, a whitish, faintly spotted breast, and is about 7 inches (18 centimeters) long. The veery builds its nest of leaves in the lower branches of bushes or small trees. The female lays from three to five greenish-blue eggs.

Scientific Classification. The veery belongs to the thrush family, *Turdidae*. It is classified as genus *Hylocichla*, species *H. fuscescens*. LEON A. HAUSMAN

VEGA, *VEE guh*, is the third brightest star in the northern celestial hemisphere. It is on the western triangle of the constellation Lyra, and is often called the *arc light of the sky*. Its light resembles the bluish-white color of a diamond. In 12,000 years, Vega will become the earth's polestar. See also ASTRONOMY (How to Use a Star Map); LYRA.

VEGA, LOPE DE (1562-1635), was the most important playwright of Spain's Golden Age. He wrote more plays than any other author. Lope was once credited with 1,800 full-length plays and 400 *autos sacramentales* (short religious plays). This total is an exaggeration, but scholars generally agree that he wrote over 400 plays. The two largest categories are "cloak-and-sword" plays of intrigue, and historical plays, such as *The Best Mayor, the King* (1616?) and *The Sheep Well* (1619?).

Lope described his theory of drama in *The New Art of Writing Plays* (1609). He rejected the dramatic unities that restricted action to a single place during a specific length of time. He believed that the best themes were conflicts of passion and the Spanish honor code. His characters usually lack individuality, but his style is poetic and his situations are exciting. Lope's influence on the dramatists of his time was strong, and he is credited with creating a Spanish national drama.

Lope Félix de Vega Carpio was born in Madrid. He led an adventurous and troubled life. Several of his love affairs ended sadly, particularly his relationship with Marta de Nevares, whom he met after becoming a priest in 1614. PETER G. EARLE

See also SPANISH LITERATURE (Drama).

National Dairy Council

Vegetables Supply Important Food Needs to Our Diet.

VEGETABLE. We eat vegetables every day, yet it is very difficult to say exactly what we mean by the word *vegetable*. Sometimes the word is used in the phrase "the vegetable kingdom," which means very much the same thing as the entire world of plants. According to another meaning, *vegetable* refers to the foods we obtain from the leaves, stems, flower clusters, roots, tubers, seeds, or fruits of plants. The word also refers to the entire plant itself.

Most people consider vegetables as different from fruits. From a scientific point of view, *fruit* refers to the seed—or seeds—of a plant, together with the parts in which it is enclosed. Thus cucumbers, eggplants, peppers, squashes, tomatoes, and string beans—all of which are commonly called vegetables—are technically fruits. But in common usage, people generally reserve the term fruit for fleshy crops that are not eaten as part of a meal's main course. Most foods referred to as fruit, such as apples and peaches, grow on plants that live and produce crops for many years.

S. H. Wittwer, the contributor of this article, is Director of the Agricultural Experiment Station at Michigan State University.

Some vegetables are important because of their leaves or stems. They include cabbage, lettuce, spinach, mustard, kale, endive, cress, parsley, asparagus, and rhubarb. Still others are important because of their roots or their underground stems and leaves. These include white potatoes, sweet potatoes, carrots, beets, turnips, rutabaga, parsnips, salsify, and onions. The seeds of other vegetables are an important part of our diet. These include vegetables such as peas, beans, soybeans, and sweet corn.

Vegetables are a great deal more important in supplying our food needs today than they have ever been before. This is because we understand what kinds of foods the human body needs much better than our grandfathers did. Vegetables are important to us because of the vitamins and minerals they contain. They are especially rich in such vitamins as vitamin A, thiamine, niacin, and vitamin C. They are also important sources of necessary minerals, including calcium, phosphorus, and iron. Doctors recommend that in addition to potatoes we eat one green, leafy vegetable and one yellow vegetable every day. Vegetables also give bulk to the diet, which helps the digestive processes. Together with the animal foods, which provide much protein, and the starchy foods, which provide carbohydrates, vegetables are among the three important types of food we should eat every day. Most vegetables, however, do not have great caloric or energy-giving value. With few exceptions, such as peas and beans, they do not contain proteins of much value to our diet.

The production of vegetables is an important part of American agriculture. Market gardeners live near centers of population. Truck farmers live farther away. They grow vegetables and ship them by refrigerator car or truck to all parts of the country. Some vegetables, such as tomatoes and lettuces, are grown indoors in greenhouses during the winter in the northern parts of the United States. Most vegetable farmers sell their products to the canning industry. Quick-freezing processes are used to preserve many kinds of vegetables.

Growing vegetables in home gardens is a cheap way of providing food. Furthermore, it ensures getting the most nourishment from vegetables that rapidly lose part of their food value after they have been harvested.

Each year plant diseases and insects destroy millions of dollars worth of vegetables. There is no single remedy to protect against such destruction, because different diseases and insects attack different plants. Anyone intending to plant his own garden should become familiar with the various plant destroyers.

In order to grow vegetables properly, the gardener must know the special requirements of each vegetable. He must know how to prepare the soil and how to plant or transplant the crops. He must know how to cultivate and care for each separate crop of vegetables. He must know what fertilizers are needed and in what kinds of soil and in what climate each vegetable grows best. Many vegetables are ready to eat long before the fruits and seeds ripen. The gardener must know just when each kind of vegetable has reached its most edible stage, and must then harvest it at once.

Kinds of Vegetables

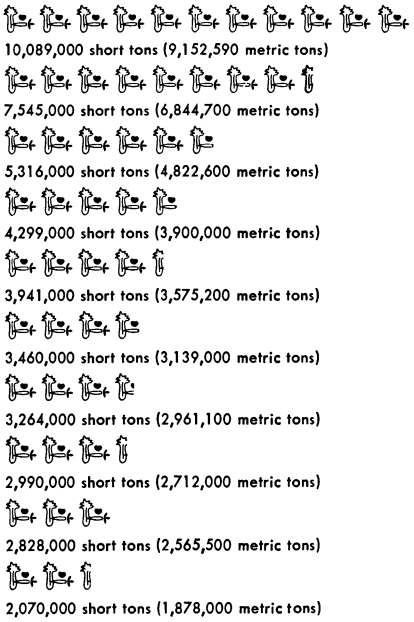
There are many different ways of classifying vegetables. Botanists may group them by the botanical families to which they belong. The cook may group them most conveniently by the ways in which they are used and prepared for the table. But the gardener is chiefly interested in a classification of vegetables which is based upon the kind of climate the vegetables require and the way in which they are grown. The following are the most important kinds of vegetables based upon this classification:

(1) Rapidly growing hardy crops which cannot endure the heat of summer. These crops are grown in the winter in the Southern States. In the North, they are planted as soon as the soil can be worked in the spring, usually three or four weeks before the last frost. Important vegetables in this group are leaf lettuce, radishes, spinach, mustard, cress, turnips, and peas.

(2) Moderately hardy but slowly developing crops

LEADING VEGETABLE-GROWING STATES

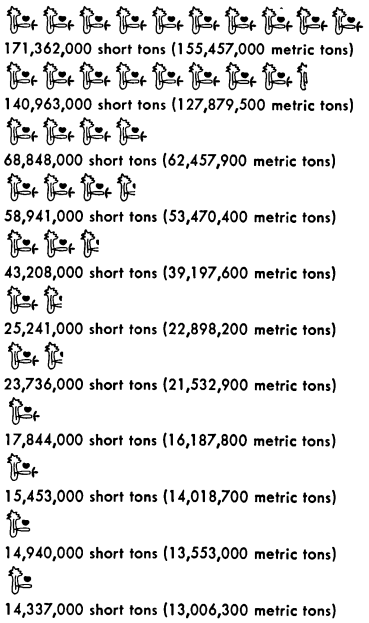
Tons of vegetables grown in 1971



Source: U.S. Department of Agriculture

LEADING VEGETABLE-GROWING COUNTRIES

Tons of vegetables grown each year (1971 and earlier years)



Source: FAO

that must be well advanced in growth before the heat of summer comes. These include early potatoes and onions grown from seed. They should be planted with the vegetables of Group 1.

(3) Perennial crops to be planted at the same time as those in Group 1. These include asparagus, chives, garlic, and rhubarb.

(4) Moderately hardy crops that grow slowly and that endure summer heat well. Some of these are grown as winter and late spring crops in the southern states. In the North, they may be planted one to two weeks before the last frost. Carrots, beets, parsnips, salsify, and parsley are usually planted in a row as seeds. Early cabbage, early cauliflower, Italian broccoli, and head lettuce are usually started indoors, and the young plants are transplanted outside.

(5) Moderately tender crops. These crops cannot endure freezing temperatures and must be planted so that the seedlings emerge after the last frost. They include snap beans, sweet corn, and popcorn.

(6) Very tender crops that are extremely sensitive to cold. The wise gardener will not plant them until two to three weeks after the last frost. Lima beans, soybeans, cucumbers, muskmelons, summer squash, winter squash, pumpkins, okra, and watermelon are usually planted in rows. Tomatoes, peppers, eggplant, and sweet potatoes are usually started indoors, and the young plants are transplanted outdoors.

(7) This group includes the fall garden vegetables. They are usually not successful if planted early in the spring garden. They are planted during the summer months, and the crop matures in time for harvesting in the fall of the year. Among these leafy fall garden vegetables are endive, kale, collards, and Chinese cabbage.

S. H. Wittwer

Related Articles. See the Agriculture section of the various state, province, and country articles for a discussion of vegetables grown there, such as Arkansas (Agriculture). Additional related articles in World Book include:

Vegetables

Artichoke
Asparagus
Bean
Beet
Broccoli
Brussels Sprouts
Cabbage
Carrot
Cauliflower
Celery
Chayote
Chinese Cabbage
Chive
Collards
Corn
Cowpea
Cress
Cucumber
Eggplant
Endive
Garlic
Horseradish
Kale
Kohlrabi
Leek
Lentil
Lettuce
Lima Bean
Muskmelon
Mustard
Okra
Onion
Parsley
Parsnip
Pea
Peanut
Pepper
Potato
Pumpkin
Radish
Rhubarb
Rutabaga
Salsify
Shallot
Sorrel
Soybean
Spinach
Squash
Sweet Potato
Swiss Chard
Taro
Tomato
Turnip
Watermelon
Yam

Other Related Articles

Agriculture
Canning
Farm and Farming
Food (color picture: A Week's Food)
Food, Frozen
Food, Preservation
Gardening
Horticulture
Nutrition (Basic Food Groups)
Plant
Truck Farming
Vegetable Oil
Vegetarianism

VEGETABLE DYE. See Dyes and Dyeing (Natural Dyes).

VEGETABLE IVORY. See IVORY PALM.

VEGETABLE OIL is a fatty substance obtained from certain plants. Most vegetable oils are liquids. But several, including cocoa butter, coconut oil, and palm oil, are solids at temperatures below about 75° F. (24° C). People use vegetable oils in various foods and in making paint, soap, and other products.

Most vegetable oils are obtained from fruit or seeds. Oils extracted from fruit include olive and palm oil. Seeds provide cocoa butter and a number of other oils, including coconut, corn, cottonseed, linseed, palm kernel, peanut, rapeseed, safflower, and soybean oil.

Uses. Vegetable oils are used mainly in producing or cooking many kinds of foods. These oils consist almost entirely of fat, an essential part of a healthful diet. For more information on the food value and chemical composition of vegetable oils, see FAT.

The chief vegetable oils used in the United States are corn, cottonseed, and soybean oil. People use these oils, as well as olive and peanut oil, in frying food and as salad oil. Most salad dressings include soybean oil. Margarine and other solid shortenings are made from corn, cottonseed, palm, safflower, or soybean oil. Candy manufacturers use cocoa butter, coconut oil, and palm kernel oil.

Many nonfood products also contain vegetable oil. For example, manufacturers make cosmetics, shampoos, and soaps from coconut, palm, and palm kernel oil. Some medicines contain cocoa butter or castor, olive, or wheat germ oil. Many paints and varnishes include a *drying oil*, such as linseed, soybean, or tung oil. Drying oils combine with oxygen from the air to form a tough coating. See OIL (Fixed Oils).

Production of vegetable oils begins with their extraction from fruit or seeds. Many oils are simply squeezed out. For example, processors use a powerful machine called a *high-pressure press* to squeeze out coconut and palm oil and some cottonseed oil. This procedure removes nearly all the oil from the fruit or seeds. But the high pressure heats the oil, which develops a dark color and a strong flavor as a result. Oils may also be squeezed out under low pressure in a process called *cold pressing*. This process, which does not heat the oil, results in a light-colored, mild-flavored product. But low-pressure extraction does not remove all the oil from the plant. Manufacturers use cold pressing chiefly to obtain olive oil.

A process known as *solvent extraction* is sometimes used to remove the oil. In this process, the manufacturer soaks the fruit or seeds in a liquid called a *solvent* that dissolves oil. A mixture of plant material, solvent, and oil results. Machines then remove the plant material and evaporate the solvent to obtain the oil. Most soybean oil is produced by solvent extraction.

Processors squeeze part of the oil from some sources, including corn, cottonseed, and peanuts. They remove the remaining oil from the seeds with solvents.

Oils obtained by high-pressure or solvent extraction are bleached, deodorized, and purified to produce a high-quality product. Cold-pressed oils require no further processing. THEODORE J. WEISS

Related Articles in WORLD BOOK include:

Chocolate	Copra	Corn Oil	Cottonseed Oil
Hydrogenation	Olive Oil	Peanut	Soybean
Linseed Oil	Paint	Rape	Tung Oil
Margarine	Palm Oil	Safflower	Varnish

VEGETARIANISM, *vej uh TAIR ih uh nizuhm*, is the practice of living on a meatless diet. Vegetarians consider all animal flesh as meat—including the flesh of fish and fowl. Most vegetarians exclude meat from their diet, but eat butter, cheese, eggs, and milk. However, some vegetarians eat only food from plants. They exclude from their diet both meat and animal products. The term *vegetarianism* came into use in the late 1840's, but the idea of such a diet is hundreds of years old.

Vegetarians have several reasons for their beliefs. Health is an important reason. Vegetarians point out that animals raised for meat are subject to diseases, and eating the meat of diseased animals can make men ill. They also claim that vegetables, cereal grains, and fruits contain all the elements that the body needs to stay healthy. Vegetarians argue that meat is expensive, and that it is more economical to use land for growing plants than for raising animals. Some persons are vegetarians because of religious beliefs or personal moral codes. They believe it is wrong to kill any animal for food.

Vegetarians must plan their diets carefully in order to stay healthy. Vegetables are sources of essential minerals and vitamins, and cereals are cheap and readily available sources of energy. But diets that include no animal products may not have enough proteins. Proteins are especially important to growth and the repair of body tissues. Corn is a healthful food, but its proteins lack two kinds of amino acids that the body must have. Persons who base their diet on corn may develop a disease called *kwashiorkor*, which causes swelling and stunted physical and mental development. It is most common in children who do not get enough proteins. It is common in parts of Africa and Latin America.

Most vegetarians try to get the proteins they need by eating the seeds of legumes such as beans, peas, and peanuts. These foods are rich in proteins. Vegetarians can also buy specially prepared food supplements to add essential nutrients to their diets. WILLARD J. JACOBSON

See also NUTRITION.

VEGETATION. See GRASSLAND; PLANT; DESERT.

VEIN. See LEAF (The Parts of a Leaf).

VEIN, *vayn*, is a deposit of mineral matter which has filled a *fault* (crack) or seam in a rock. Over a long period of time, water deposits the mineral matter in the rock openings. The solution may be ground water which seeps down through the rocks and deposits the mineral. The minerals may also be deposited by *thermal solution* (heated water) which rises from deeper within the earth, or by vapor given off by nearby rocks.

Veins vary in thickness from a thin sheet to a layer many feet or meters thick. They vary in length from a few inches or centimeters to several miles or kilometers. Most veins slant into rock. The direction a vein follows is called its *strike*. Some veins stand out on the surface of the ground like low ridges that cross in strange patterns. The material of such veins resists wear from weather better than the rock on either side of them. Some veins contain the ores of one or more metals and are known as metalliferous veins. Many metallic ore mines are dug along such veins.

Granite *dikes* (rock layers in cracks of other rocks) are often called veins. There is no sharp distinction be-

tween veins and dikes. But, in general, the material of veins was deposited gradually. The material of dikes is usually accumulated all at once. GEORGE B. CLARK

VEIN is a blood vessel which carries blood toward the heart. The blood circulates in the body through a system of tubes called blood vessels. The three kinds of vessels are arteries, capillaries, and veins. Veins return blood to the heart after it has given out nourishment to the tissues and taken up waste products and poisons. Blood in veins is called *venous* blood. See the Trans-Vision three-dimensional color picture with HUMAN BODY.

The blood returning from the body cells has lost much of its oxygen, and is brownish in color. It circulates through the right side of the heart and then goes to the lungs. Here it gives off its waste carbon dioxide and takes on a new supply of oxygen. Red blood from the lungs returns to the heart through the pulmonary veins. Then it begins its trip through the body.

The veins begin at the capillaries. At first they are very tiny, and are called *venules*. Small veins join to form larger ones. Finally all the venous blood of the body pours into two very large veins which open into the heart. One of these, the *superior vena cava*, carries blood from the head and arms. The other, the *inferior vena cava*, carries it from the trunk and legs.

Veins, like arteries, have walls made of three layers. But the vein walls are thinner, less elastic, and less muscular than those of the arteries. The lining membrane of the veins is the *intima*. In many of the larger veins, the intima has folds which serve as valves. These folds lie against the wall when the blood is flowing freely. Several things can cause the blood to slow down or stop—the weight of blood above the vessel, effects of gravity, pressure on a vein, or low fluid pressure. Then the valves open out, and stop the blood from flowing backward. The valves are usually just above the place where two veins join. There are no valves in the veins of the abdomen, brain, and lungs, or in the smaller veins.

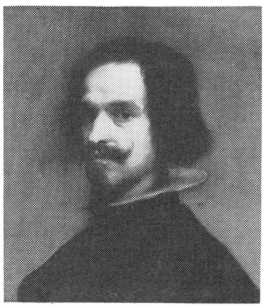
Veins that are swollen, stretched, or coiled on themselves are *varicose* veins. *Phlebitis* is inflammation of a vein. In this disease a blood clot forms, and causes pain and stiffness. JOHN B. MIALE

Related Articles in WORLD BOOK include:

Aneurysm	Bloodletting	Jugular Vein	Varicose
Artery	Heart	Phlebitis	Vein

VELASCO IBARRA, JOSÉ. See ECUADOR (The 1900's).

VELÁZQUEZ, *vuh LAHS kuhs,* **DIEGO** (1599-1660), was an important Spanish baroque painter. Many characteristics of his style can be seen in one of his masterpieces, *Las Meninas* (*Maids of Honor*). This painting is reproduced in color in the PAINTING article. *Las Meninas* shows Velázquez' use of realism, rich colors, light and shadow, and his ability to place his subjects in space. Despite the apparent effortless quality of his paintings, Velázquez was a painstaking craftsman who constantly reworked his canvases. His pictures have influenced such later artists as Gustave Courbet, Édouard Manet, and Pablo Picasso. See BAROQUE (Painting).



The Metropolitan Museum of Art

Velázquez painted this well-known portrait of himself.

Diego Rodriquez de Silva y Velázquez was born in Seville. As a youth, he studied with Francisco Pacheco. Pacheco taught him the style of the Italian artist Michelangelo Caravaggio, characterized by its realism and use of somber light and dark tones. Velázquez began to paint for King Philip IV in 1623, and was a successful court painter for the rest of his life.

In 1629 Velázquez went to Italy, where he studied the art of ancient Rome and perfected his ability to paint nudes. After his return to Spain in 1631, he produced a series of great royal portraits as well as *The Surrender of Breda* (*The Lances*), one of the world's finest historical paintings.

Velázquez again visited Italy from 1649 to 1651. While in Rome he did a penetrating portrait of Pope Innocent X and also painted his only pure landscapes. After his return to Spain, Velázquez painted some of his greatest pictures. These include his most dazzling court portraits—*Venus With a Mirror*, one of the few nudes in Spanish art; *The Spinners*, based on the Greek legend of Arachne; and *Las Meninas*. MARILYN STOKSTAD

VELD. See PRAIRIE.

VELLUM is fine animal skin used for paper. See BOOK (Early Forms of Books); PARCHMENT (Fine Parchment).

Gaspar Cardinal de Borja Velasco, by Velázquez, shows how well the painter portrayed the personality of his subjects.

The Metropolitan Museum of Art

VELOCIPEDE, *vuh LAHS uh peed*, is a name for any relatively light vehicle propelled by the rider or riders. The name was applied especially to early forms of bicycles and tricycles. See also BICYCLE.

VELOCITY, *vuh LAHS uh tih*, is the rate at which a body moves in space in a given direction. Velocity is expressed in distance and time, such as miles per hour or meters per second. There is an important difference between speed and velocity. *Speed* indicates the rate of motion in any direction. When a body is said to have a speed of 40 miles per hour, it indicates that that is the rate in any direction. But *velocity* indicates the rate in one fixed direction. This means that a body may have a velocity of 40 miles per hour north of one particular point. Mathematically, velocity is a *vector* quantity, because it has both speed and direction.

Types of Velocity. Velocity may be *uniform*, which means the spaces traveled during a given unit of time are the same throughout the motion. To find the uniform velocity of a body we need only divide the distance traveled by the time. This could be stated in the formula $V=\frac{d}{t}$ where V is equal to velocity, d is equal to distance, and t is equal to time.

Velocity may be *variable*. This means that the spaces passed in a given unit of time are not equal throughout the motion. For example, a moving object could have a velocity of 30 meters per second at a certain instant and then speed up to 60 meters per second. If the object gained speed uniformly, its average velocity would equal its initial velocity plus its final velocity divided by two. This could be written

$\text{Av. } V = \frac{V_1 + V_2}{2}$ where Av. V represents the average velocity, V_1 is equal to the initial velocity and V_2 is equal to the final velocity.

Accelerated Velocity. Variable velocity may be positively or negatively accelerated. A *positively accelerated* velocity means that, during each portion of time, the body passes through a greater space than during the preceding portion of time. A falling body has a positively accelerated velocity. In *negative acceleration*, such as a train stopping, a smaller space is traveled in each successive unit of time. ROBERT F. PATON

See also ACCELERATION; MOTION; FALLING BODIES, LAW OF; CALCULUS.

VELON. See FIBER (Synthetic Fibers); SARAN.

VELOUR, *vuh LOOR*, is a soft, velvety cloth made of wool, or of rayon and wool blends. Velour has a pile surface on one side and a plain or satin weave on the other. Velour is used for making women's coats, draperies, and upholstery material.

VELVET is a cloth with a soft, deep *nap* (surface). Clothmakers call this nap the *pile*. Velvet is made of silk, rayon, nylon, cotton, or a mixture of two or more of these yarns.

To make the pile, manufacturers weave two pieces of material at the same time, using three *warp* (lengthwise) yarns and two *weft* (crosswise) yarns. In each piece, they weave one set of weft yarns with one set of warp yarns in a plain or twill weave. Then they weave the extra warp yarn into the two pieces of material, first into one and then into the other. Finally, the two pieces of velvet are cut apart. Manufacturers also produce velvet in a single layer fabric. They insert wires as weft yarns and then withdraw the wires. As the wires are withdrawn, a small knife on the end of them cuts the warp yarns to produce a soft pile.

Velvet is usually made with silk yarn in the pile and cotton in the background. Silk velvet has only silk yarn. Velvet cloth comes in 36- to 39-inch (91- to 99-centimeter) widths.

A pile fabric that is woven by using extra weft yarn is called *velveteen*. When the pile is woven in ridges and cut, the cloth is *corduroy*. If thicker than $\frac{1}{8}$ inch (3 millimeters), the cloth is *plush*. KENNETH R. FOX

See also CORDUROY; VELVETEEN.

VELVET LEAF. See INDIAN MALLOW.

VELVETEEN is a short-pile cotton fabric that resembles velvet but is woven singly with the weft forming the piles. It comes in widths of 18, 20, and 36 inches (46, 51, and 91 centimeters). It is used in clothing, heavy curtains, and draperies.

VENA CAVA. See HEART (How the Heart Works).

VENATION. See BOTANY (Terms).

VENDETTA, *ven DET uh*, is a family feud once common in Italy, especially in Corsica and Sicily. One family fought another, often savagely, to avenge a personal injury or murder. The victim's nearest relative had to take revenge on the offender. If the offender could not be punished, vengeance had to be taken on his next of kin. Vendettas were similar to the family feuds that have taken place in the hills of Kentucky and Tennessee. See also FEUD. WILLIAM H. MAEHL

VENDING MACHINE is a device that dispenses a product or service when money is put into it. Vending machines dispense many types of merchandise, including candy, cigarettes, chewing gum, and soft drinks. In some areas, drive-in vending machine centers are open 24 hours a day. They sell prepared foods, grocery items, and beverages.

Many businesses, schools, and hospitals use special types of vending machines in their lunchrooms. These machines dispense beverages, soup, sandwiches, complete hot meals, and desserts. Vending machines in some airports sell air travel insurance. Coin-operated washing machines and dry-cleaning machines are familiar service vending machines.

How Vending Machines Work. Most vending machines accept coins only. With some types, the user must insert the exact change before the machine will operate. With others, the user can insert a coin larger than the purchase price. The machine will refund the proper amount of change along with the item. Some vending machines, known as *currency-changers*, will even accept paper money and make change. Some vending machines can distinguish between bills of different denominations. They return the proper amount of change for each denomination that they can accept.

The Vending Machine Industry is composed of manufacturing companies, operating companies, and companies that supply the products sold in the machines. The manufacturers produce the machines. The operating companies place them in suitable locations, and keep them stocked and in proper working order. Operating companies usually pay a fee to the owner of the location where a machine is placed for the use of his space. The fee paid to the owner of the location is

based on the sales the vending machine makes.

History. A device that dispensed holy water in a Greek temple in Alexandria, Egypt, in the 200's B.C. is the earliest known vending machine. The first machines in the U.S., chewing gum dispensers, appeared on New York City train platforms in the late 1880's. Cigarette vending machines first appeared in the 1920's. Since then, vending machines have developed into a major industry in the U.S. Sales reached nearly $3 billion a year in the 1960's. THOMAS B. HUNGERFORD

See also COIN MACHINE; AUTOMAT.

VENEER, *vuh NEER,* is a thin sheet of wood of uniform thickness cut by peeling, slicing, or sawing logs. It is used primarily for plywood panels made by gluing sheets of veneer together. Single sheets of veneer are used to make such items as fruit baskets, crates, and packing boxes.

Most veneer is cut from the Douglas fir, but many other varieties of wood are also used. There are several ways of cutting veneer, but the most popular is the *rotary-cut* method. In this method, the log is placed in a lathe and then revolved against a knife extending across the length of the log. The veneer is unwound in a long ribbon, much like unrolling a bolt of wrapping paper or cloth. Veneers vary in thickness from $\frac{1}{110}$ to $\frac{3}{8}$ inch (0.23 to 9.5 millimeters). Most rotary veneers are cut in thicknesses from $\frac{1}{20}$ to $\frac{1}{7}$ inch (1.3 to 3.6 millimeters).

In the early 1970's, the United States produced about 1 billion cubic feet (28 million cubic meters) of veneer logs a year. Canada produced more than $2\frac{1}{2}$ billion square feet (232 million square meters) of veneer yearly. HARRY E. TROXELL

See also MAHOGANY; PLYWOOD.

VENER. See LAKE VÄNERN.

VENERABLE BEDE, THE. See BEDE.

VENEREAL DISEASE, *vuh NEER ee ul,* is a general term for several serious and widespread diseases. The chief venereal diseases are syphilis and gonorrhea. These diseases are increasingly important social problems today. The name *venereal* comes from Venus, the Roman goddess of love, because these diseases are almost always spread through sexual intercourse or other direct contact with an infected person. Venereal diseases are rarely transmitted by infected objects because the germs die quickly outside the human body.

Syphilis is an infection by a tiny *spirochete* (spiral germ) known as *Treponema pallidum.* This germ usually enters the body through a break in the skin or mucous membrane. Once in the body, it may attack any kind of tissue.

Syphilis is highly contagious in its early stages, but usually it does not make the person extremely ill at this time. The germs may cause a sore at the place where they entered. Later they invade the lymph glands or cause sores in the mouth or on the skin. The patient may also be nervous, feverish, anemic, and lose weight. These symptoms may disappear, but meanwhile the germ spreads through the blood to other parts of the body. In its late stages it may attack the brain, spinal cord, blood vessels, and valves of the heart. It can cause insanity, paralysis, blindness, heart disease, or large open sores on the skin.

Infected mothers can give syphilis to their unborn children, because the tissues between mother and child do not filter out the spirochetes. It is important that a woman be examined for this disease before she has a baby. If she is infected, proper treatment will prevent infection of the child. Most states do not issue marriage licenses until a medical test has shown that the persons are free from venereal disease. *Serologic tests* (blood tests) are widely used that will discover syphilis even when the symptoms have disappeared.

Persons who have syphilis can be cured, especially if they go to a physician for treatment in the early stages. The German doctor Paul Ehrlich was the first to discover a drug that kills the germ. Treatment of syphilis with penicillin, erythromycin, or tetracyclines can cure the disease. But treatment cannot repair damage the disease may cause.

Gonorrhea usually affects the mucous membrane, especially of the sex organs and the eyes. It is caused by a bacterium known as the *gonococcus.* Symptoms are an irritation of the sex organs and a discharge of pus. They may begin from three days to three weeks after infection. The disease is highly contagious and may spread on the mucous membrane. Gonorrhea is more serious, especially in women, than many persons believe. It does great damage when it spreads through the reproductive organs. It often causes blindness, especially in babies. Infected mothers do not give gonorrhea to their unborn children, but the infant may pick up the germ while being born. It is now common practice to drop silver nitrate solution in the eyes of infants immediately after birth. This prevents the possibility of blindness from gonorrhea.

Gonorrhea can usually be cured with penicillin or other antibiotics, such as tetracycline. In some cases the treatment takes only a few days.

Other Venereal Diseases include chancroid, and venereal lymphogranuloma. Venereal lymphogranuloma is an infection which attacks the lymph glands of the groin. SIDNEY OLANSKY

See also DISEASE (graph: Main Contagious Diseases in the U.S.); EHRLICH, PAUL; TABES.

VENESECTION. See BLOODLETTING.

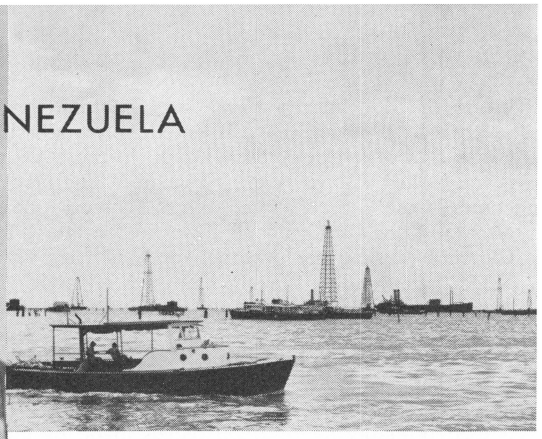
VENETIA, *vuh NEE shee uh,* is a region in northeastern Italy that includes the city of Venice. Venetia became the tenth region of Italy under Roman rule. Invasions of the Huns and Germans in the A.D. 400's and 500's devastated the region. Refugees fled to tiny islands in the lagoons and founded Venice. Venice became the region's most important city during the Middle Ages and the Renaissance period. For location, see ITALY (political map). MARY FRANCIS GYLES

VENETIAN BLIND is a window blind made of slats. Venetian blinds are given this name because they were widely used in Venice during the 1600's. Similar curtains had been developed earlier by the Japanese, who used bamboo rods. Today, Venetian blinds have slats made of metal, wood, or some other sturdy material. The slats are hung on tapes in such a way that each slat slightly overlaps the next one when they are closed. The slats are operated by cords and pulleys which can be adjusted to keep out sunlight but admit breezes.

VENETIAN GLASS. See GLASS (The Middle Ages); GLASSWARE (picture).

VENEZIA TRIDENTINA. See TRENTINO-ALTO ADIGE; TYROL.

VENEZUELA



Oil Drilling Rigs dot Venezuela's Lake Maracaibo. The lake has more than 2,000 oil wells.

Spirited Folk Dances are a popular form of Venezuelan entertainment.

Wide World; Gendreau

VENEZUELA, *VEN uh ZWAY luh,* is a republic on the northern coast of South America. The name *Venezuela* is Spanish for *little Venice.* When Spanish explorers reached the country, they found an Indian village built on wooden poles above the shallow waters of Lake Maracaibo. The village reminded them of Venice, Italy, and they named it Venezuela. The official name of the country is REPÚBLICA DE VENEZUELA (REPUBLIC OF VENEZUELA). Caracas is the nation's capital and largest city.

Venezuela covers an area a little larger than Texas and Oklahoma combined. The country has rich deposits of petroleum, iron ore, diamonds, gold, copper, bauxite, manganese, salt, marble, and other minerals. Petroleum pours over $1 million a day into the treasury. It also pays for the great building expansion that is making Venezuela one of the most modern countries in Latin America.

Christopher Columbus arrived at Venezuela on Aug. 1, 1498. He went ashore on the peninsula of Paria. Thus, Venezuela became the first part of the mainland of the Western Hemisphere on which Columbus actually landed. Cumaná in northeastern Venezuela is the

W. Donald Beatty, the contributor of this article, is coauthor of Introduction to Hispanic American History.

FACTS IN BRIEF

Capital: Caracas.

Official Language: Spanish.

Form of Government: Republic.

Head of State: President (five-year term).

Divisions: One Federal District, two territories, 20 states, and 72 islands which are federal dependencies.

Area: 352,145 sq. mi. (912,050 km²). *Greatest Distances*—east-west, 928 mi. (1,493 km); north-south, 790 mi. (1,271 km). *Coastline*—1,750 mi. (2,816 km).

Elevation: *Highest*—Pico Bolívar, 16,411 ft. (5,002 m) above sea level. *Lowest*—sea level along the coast.

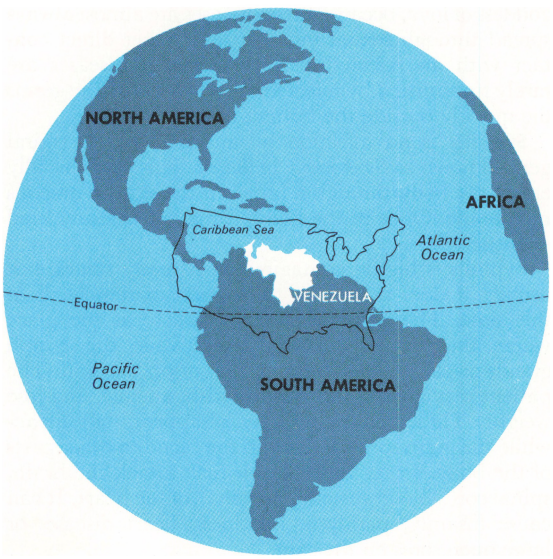
Population: *Estimated 1976 Population*—12,539,000; distribution, 73 per cent urban, 27 per cent rural; density, 36 persons per sq. mi. (14 persons per km²). *1971 Census*—10,721,522. *Estimated 1981 Population*—14,820,000.

Chief Products: *Agriculture*—cacao, cattle, coffee, corn, cotton, rice, sugar cane, tobacco. *Mining*—diamonds, gold, iron ore, natural gas, petroleum. *Manufacturing and Processing*—petroleum products, textiles.

National Anthem: "Gloria al Bravo Pueblo" ("Glory to the Brave People").

Flag: The *national flag,* flown by the people, has seven white stars (for the original seven provinces) arranged in an arc on three horizontal stripes of yellow (for Venezuela), blue (for the Atlantic), and red (for Spain, Venezuela's former ruler). The tricolor was adopted in 1811. The *state flag,* used by the government, has the coat of arms on the yellow stripe. See FLAG (color picture: Flags of the Americas).

Money: *Basic Unit*—bolívar. For its value in dollars, see MONEY (table: Values). See also BOLÍVAR.



WORLD BOOK map

Venezuela, which is about a tenth as large as the United States, lies on the northern coast of South America on the Caribbean Sea.

VENEZUELA
Barren Areas Above Timber
Evergreen Trees
Shrub
Grass
National Capitals
State and Other Capitals
Cities and Towns
Rail Lines
0 20 40 60 80 100 120 140 Miles
0 40 80 120 160 Kilometers
Caribbean Sea
North Atlantic Ocean
Gulf of Venezuela
Gulf of Paria
Lake Maracaibo
Lake Guanoco
COLOMBIA
BRAZIL
GUYANA
TRINIDAD AND TOBAGO
TRINIDAD
TOBAGO
CARACAS
Maracaibo
Barranquilla
Santa Marta
Bogotá
Medellín
Cali
Cúcuta
San Cristóbal
Mérida
Valencia
Barquisimeto
Maracay
Puerto Cabello
Maiquetía
Puerto La Cruz
Barcelona
Cumaná
Maturín
Ciudad Bolívar
Ciudad Guayana
Puerto Ayacucho
San Fernando
Port-of-Spain
Willemstad
Oranjestad
Georgetown
New Amsterdam
Orinoco
Apure
Arauca
Meta
Caroní
Negro
Branco
Essequibo
Cuyuni
Mazaruni
Demerara
Berbice
Caura
Paragua
Caquetá
Putumayo
Vichada
Guaviare
Inírida
Guainía
Casiquiare
Uraricoera
Mucajaí
Cotingo
Rupununi
Tocuyo
Yaracuy
Portuguesa
Guárico
Manapire
Cuchivero
Capanaparo
Tomo
Ventuari
Casanare
Magdalena
Catatumbo
Zulia
Cagua
Tuy
Aroa
Chivacoa
Tocuyito
Villa de Cura
San Juan de los Morros
Valle de la Pascua
Calabozo
Tucupita
Upata
Tucupita
Ciudad Guayana
Ciudad Bolívar
Puerto Ayacucho
Tunja
Sogamoso
Ibagué
Neiva
Pasto
Popayán
Cali
Medellín
Manizales
Pereira
Armenia
Cartagena
Barranquilla
Santa Marta
Maracaibo
Valencia
Caracas
Maracay
Barquisimeto
Mérida
San Cristóbal
Cúcuta
Barinas
Acarigua
Guanare
Coro
Punto Fijo
Puerto Cumarebo
Willemstad
Oranjestad
Port-of-Spain
Georgetown
New Amsterdam
Puerto Ayacucho
San Fernando
Ciudad Bolívar
Ciudad Guayana
Maturín
Cumaná
Barcelona
Puerto La Cruz
Caracas
Los Teques
Guatire
Maiquetía
La Guaira
Valencia
Barquisimeto
Maracay
Puerto Cabello
Coro
Punto Fijo
Maracaibo
Cabimas
Ciudad Ojeda
Barranquilla
Santa Marta
Ciénaga
Soledad
Valledupar
Bucaramanga
Barrancabermeja
Cúcuta
San Cristóbal
Mérida
Barinas
Acarigua
Guanare
Coro
Puerto Cumarebo
Punta Cardón
Willemstad
Oranjestad
ARUBA
CURAÇAO (NETHERLANDS)
BONAIRE
ISLAS DE AVES
ISLAS LOS ROQUES
LA ORCHILA
LA BLANQUILLA
ISLAS LOS TESTIGOS
ISLA DE MARGARITA
ISLA LA TORTUGA
CAPE CODERA
PENÍNSULA DE PARAGUANÁ
PENÍNSULA DE PARIA
Río Caribe
Güiria
Carúpano
Cumaná
Caripito
Puerto La Cruz
Barcelona
Guanta
Aragua de Barcelona
Anaco
Cantaura
Zaraza
Tucupido
Valle de la Pascua
Calabozo
Altagracia de Orituco
Ocumare
Santa Teresa
Los Teques
Guatire
Guacara
Moron
Aroa
San Felipe
Chivacoa
Tocuyito
Villa de Cura
San Juan de los Morros
San Carlos
Araure
Acarigua
Villa Bruzual
Barinas
Barinitas
Mérida
San Carlos
El Vigía
Tovar
La Grita
Colón
Táriba
San Cristóbal
Cúcuta
San Antonio
Rubio
Pamplona
Bucaramanga
Barrancabermeja
Tunja
Sogamoso
La Dorada
Bogotá
Girardot
Ibagué
Neiva
Pasto
Popayán
Cali
Medellín
Manizales
Pereira
Armenia
Cartagena
Barranquilla
Santa Marta
Maracaibo
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Los Teques
Guatire
Maiquetía
La Guaira
Valencia
Barquisimeto
Maracay
Puerto Cabello
Coro
Punto Fijo
Maracaibo
Cabimas
Ciudad Ojeda
Barranquilla
Santa Marta
Ciénaga
Soledad
Valledupar
Bucaramanga
Barrancabermeja
Cúcuta
San Cristóbal
Mérida

oldest continuously occupied settlement in South America founded by Europeans. It dates back to 1512.

The Land and Its Resources

Location, Size, and Surface Features. Venezuela faces the Caribbean Sea along the northern coast of South America. The *Color Map* shows that Colombia borders Venezuela on the west, Brazil on the south, and Guyana on the east.

The country has four geographic regions. They are (1) the Maracaibo lowlands, (2) the northern highlands, (3) the Orinoco plains, and (4) the Guiana highlands.

The low, flat *Maracaibo Lowlands* of northwestern Venezuela are almost surrounded by mountains. Lake Maracaibo dominates the region, and is the largest lake in South America. It covers 6,300 square miles (16,317 square kilometers). Swamps dot the shores of the lake.

The *Northern Highlands* region consists of four sections. The *Cordillera de Mérida* forms the southwestern part of the highlands and includes the highest mountains in Venezuela. The range starts on the Colombia border south of Lake Maracaibo and extends in a northeastern direction toward the Caribbean Sea. The *Segovia highlands*, an area of low mountains, lie north of the Cordillera de Mérida.

Two parallel ranges border the Caribbean coast between the city of Puerto Cabello and Cape Codera. The coastal range rises abruptly from the sea, and is the higher of the two ranges. Fertile valleys lie between the mountains. This region is the *central highlands*, and is the social, economic, and political center of Venezuela. The fourth section of the northern highlands is the *northeastern highlands*. It consists of low-lying mountains in the Araya and Paria peninsulas.

The *Orinoco Plains* cover about 120,000 square miles (311,000 square kilometers). This vast, flat area lies between the northern highlands and the Orinoco River. The river rises in southern Venezuela. It flows 1,281 miles (2,062 kilometers) and empties into the Atlantic Ocean through a series of channels on Venezuela's northeastern coast. The Caroní and Caura rivers, and other branches of the Orinoco, run through the plains.

About half of Venezuela lies south of the Orinoco plains in the *Guiana Highlands*. The region consists of a high plateau, out of which rise many higher *mesas* (flat-topped land masses with steep sides). Angel Falls in the northeastern part of the Guiana highlands is the highest waterfall in the world. The height of the falls is 3,212 feet (979 meters), more than 15 times as high as Niagara Falls in the United States.

The Guiana highlands furnished the settings for two famous novels, Sir Arthur Conan Doyle's *Lost World* and W. H. Hudson's *Green Mansions*.

A number of small islands lie off the northern coast. The largest is Margarita, which is famous for its pearl fisheries.

VENEZUELA MAP INDEX

States*

AMAZONAS (TERRITORY)	12,544	C 2
ANZOÁTEGUI	455,923	B 3
APURE	158,250	B 1
ARAGUA	394,529	A 2
BARINAS	195,156	B 1
BOLÍVAR	303,109	B 3
CARABOBO	463,441	A 2
COJEDES	91,214	B 2
DELTA AMACURO (TERRITORY)	34,198	B 3
DEPENDENCIAS FEDERALES (LOS ROQUES) (DEPENDENCY)	861	A 2
DISTRITO FEDERAL (FEDERAL DISTRICT)	1,771,367	A 2
FALCÓN	367,185	A 1
GUÁRICO	315,034	B 2
LARA	553,138	A 1
MÉRIDA	316,202	B 1
MIRANDA	638,302	A 2
MONAGAS	296,365	B 3
NUEVA ESPARTA	95,293	A 3
PORTUGUESA	272,279	B 2
SUCRE	467,818	A 3
TÁCHIRA	487,781	B 1
TRUJILLO	366,275	B 1
YARACUY	199,758	A 2
ZULIA	1,263,890	B 1

Cities and Towns

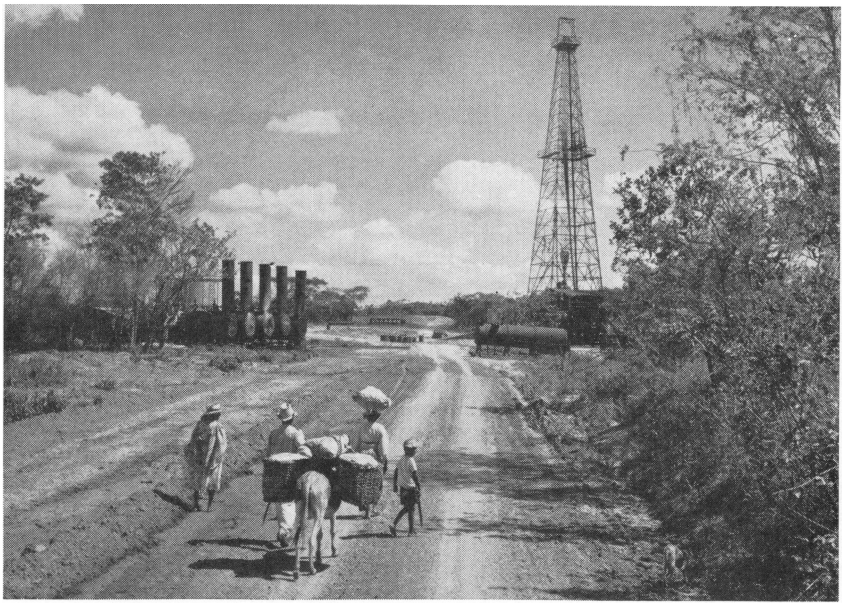
Acarigua	42,471	B 2
Altagracia	11,147	A 1
Altagracia de Orituco	19,195	B 2
Anaco	32,488	B 3
Aragua de Barcelona	10,689	B 3
Araure	17,804	B 2
Aroa	7,869	A 2
Bachaquero	20,181	B 1
Barcelona	51,902	A 3
Barinas	43,737	B 1
Barinitas	8,006	B 1
Barquisimeto	262,711	A 2
Bejuma*	10,320	A 2
Boconó	15,158	B 1
Cabimas	138,732	A 1
Cagua	21,167	A 2
Calabozo	25,826	B 2
Cantaura	21,165	B 3
Caraballeda*	10,376	A 2
Caracas	786,710 *1,958,977	A 2
Cardón*	12,860	A 1
Caripito	26,001	A 3
Carora	31,979	A 1
Carúpano	44,140	A 3
Chivacoa	17,581	A 2
Ciudad Bolívar	98,007	B 3
Ciudad Guayana	98,000	B 3
Ciudad Ojeda	79,571	A 1
Colón	12,383	B 1
Coro	53,641	A 2
Cumaná	92,983	A 3
El Tigre	51,646	B 3
El Tocuyo	21,527	B 2
El Vigía	13,354	B 1
Guacara	15,111	A 2
Guanare	29,351	B 2
Guanta	10,550	A 3
Guarenas*	19,517	A 2
Guatire	14,873	A 2
Güigüe*	15,147	A 2
Güiria	14,336	A 3
La Asunción	6,224	A 3
La Concepción	13,040	A 1
La Grita	10,003	B 1
La Guaira	24,181	A 2
La Paz	8,830	A 1
La Victoria	28,845	A 2
Los Teques	47,140	A 2
Machiques	14,824	A 1
Macuto*	8,372	A 2
Maiquetía	102,154	A 2
Maracaibo	621,109	A 1
Maracay	178,811	A 2
Mariara*	10,132	A 2
Maturín	86,039	B 3
Mene Grande	18,014	B 1
Mérida	68,074	B 1
Morón	10,074	A 2
Naiguatá*	9,416	A 2
Nirgua*	8,659	A 2
Ocumare	19,328	A 2
Palo Negro	16,667	A 2
Porlamar	25,819	A 3
Puerto Ayacucho	7,275	B 2
Puerto Cabello	66,253	A 2
Puerto Cumarebo	10,400	A 2
Puerto La Cruz	76,477	A 3
Punta Cardón	15,584	A 1
Punto Fijo	49,736	A 1
Quíbor	9,391	B 2
Río Caribe	8,749	A 3
Rosario	17,766	A 1
Rubio	14,464	B 1
San Antonio	19,140	B 1
San Carlos	16,760	B 2
San Carlos	20,269	B 1
San Cristóbal	141,773	B 1
San Felipe	40,311	A 2
San Fernando	38,873	B 2
San José de Guanipa	27,646	B 3
San Juan de los Morros	38,895	B 2
San Mateo*	16,330	A 2
San Rafael	9,249	A 1
Santa Teresa	8,569	A 2
Táriba	12,265	B 1
Tinaquillo	10,961	B 2
Tocuyito	9,989	A 2
Tovar	12,287	B 1
Trujillo	25,134	B 1
Tucupido	9,732	B 2
Tucupita	11,602	B 3
Turmero	10,500	A 2
Upata	19,291	B 3
Valencia	210,222	A 2
Valera	65,263	B 1
Valle de la Pascua	34,900	B 2
Villa Bruzual	17,791	B 2
Villa de Cura	25,159	A 2
Yaritagua	19,714	A 2
Zaraza	16,134	B 2

*Population of metropolitan area, including suburbs.

Physical Features

Angel Falls	B 3
Apure River	B 2
Arauca River	B 2
Islas de Aves (Islands)	A 2
Boca Araguao	B 3
Boca Grande	B 3
Capanaparo River	B 2
Cape Codera	A 2
Caroní River	B 3
Casiquiare River	C 2
Caura River	B 3
Cerro Bolívar (Mountain)	B 3
Cerro Yumari (Mountain)	C 2
Cuchivero River	B 2
Cuquenán River	C 3
El Pao (Mountain)	B 3
Guárico River	B 2
Gulf of Paria	A 3
Gulf of Venezuela	A 1
Gulf Triste	A 2
Isla de Margarita (Island)	A 3
Isla La Tortuga (Island)	A 2
Islas Los Roques (Islands)	A 2
Islas Los Testigos (Islands)	A 3
Kukenaam Falls	B 3
La Blanquilla (Island)	A 3
La Gran Sabana (Plateau)	B 3
La Orchila (Island)	A 2
Lake Guanoco	A 3
Lake Maracaibo	B 1
Manapire River	B 2
Meta River	B 2
Mt. Roraima	B 3
Negro River	C 2
Orinoco River	B 3
Paragua River	B 3
Península de Paraguaná	A 1
Península de Paria	A 3
Pico Bolívar (Peak)	B 1
Portuguesa River	B 2
Sierra de Curupira (Mountains)	C 3
Sierra Parima (Mountains)	C 3
Sierra de Perijá (Mountains)	B 1
Sierra Maigualida (Mountains)	B 2
Sierra Pacaraima (Mountains)	C 3
Tocuyo River	A 2
Ventuari River	C 2

*Does not appear on the map; key shows general location.
Sources: Latest census (1961) and official estimates (1968).



Rich Petroleum Deposits in Venezuela make it one of the most wealthy countries in Latin America. But many Indian families still trudge to market with pack mules just as their ancestors did hundreds of years ago.

Sinclair Oil Corp.

Climate varies according to altitude, from the humid heat of the coastlands to the biting cold of the mountains. The Maracaibo region has the highest average temperature in Latin America. Its temperature seldom falls below 82° F. (28° C). Caracas and other Venezuelan cities have a springlike climate all year, with the temperature averaging about 70° F. (21° C). The Orinoco plains have a dry season from December through April, and a wet season from May to November. During the dry season, vast stretches of ground become as hard and dry as cement. But, during the rainy season, rivers overflow and flood much of the plains.

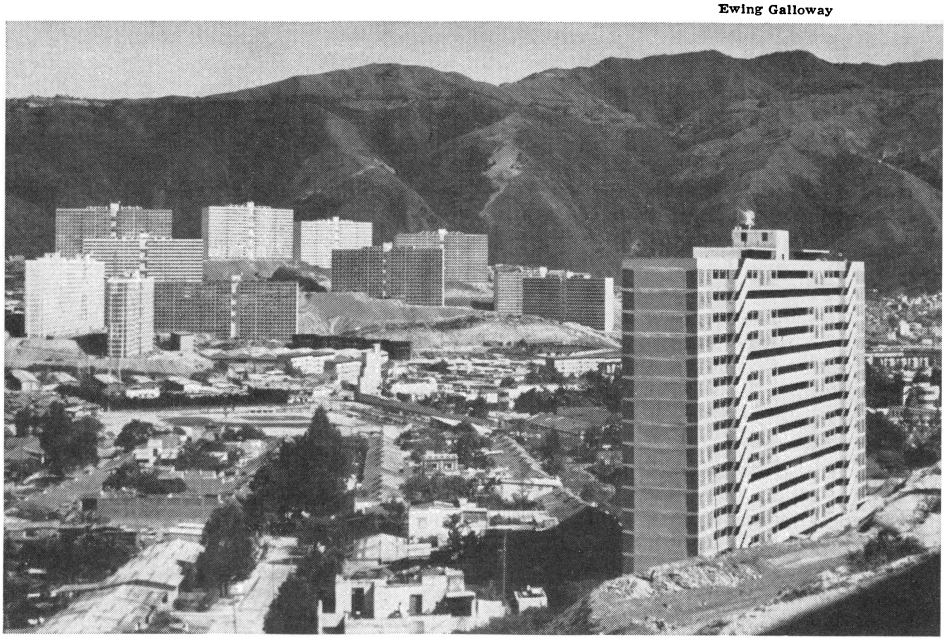
Natural Resources. Venezuela has valuable deposits of petroleum, gold, iron ore, manganese, copper, coal, asphalt, diamonds, and salt. Petroleum is the country's greatest mineral resource.

Forests cover a large part of the country. More than 600 kinds of trees grow in Venezuela. They yield rare woods, wild rubber, chicle for chewing gum, and balata, a gum used for wire insulation. Much of this forest wealth remains untouched because the rugged countryside makes it hard to reach.

The People and Their Work

The People. About seven out of ten Venezuelans are *mestizos* (mixed white and Indian). Most mestizos are farmers who live in the northern highlands. About one out of five persons is white. These people live chiefly in Caracas, and dominate the political and economic life of the country. About one out of ten persons is a Negro. The Negroes live along the Caribbean coast, and work as farmers and general laborers. Only a

Ewing Galloway



Public Housing Projects provide low-cost housing for thousands of persons in Caracas. The Government tore down shacks, leveled hills, and filled ravines to make room for the city's attractive apartment buildings and parks.

Workers with Machetes cut away the jungle to make space for growing industries. The iron-ore port of Puerto de Hierro on the Paria Gulf was built as an export center for much of Venezuela's rich iron ore. Trains and river barges carry the ore from the mines to the port. Ocean-going ships then take the ore to the United States to be processed in mills.

Bethlehem Steel Corporation

few pure-blooded Indians inhabit Venezuela. They live west of Lake Maracaibo and south of the Orinoco River. During the 1950's, Venezuela encouraged immigration of skilled workers to aid its economic expansion. By 1956, more than 340,000 immigrants had come from Italy, Spain, Portugal, France, and Austria.

Way of Life. Huge housing projects have changed the living habits of thousands of people in the northern highlands. Many people have moved from tiny shacks into comfortable, government-built apartments. But many still live in shacks made of scrap lumber.

Perhaps the most distinctive Venezuelan is the *llanero*. Llaneros are the herdsmen of the Orinoco plains. They are famous for their horsemanship, strength, and love of freedom. Their life often is rugged and lonely. Indians in the Guiana highlands lead a primitive life that has changed little during hundreds of years.

Corn is the basis for many Venezuelan dishes. *Hallaca* is the local version of the Mexican tamale. It is a corn-meal cake stuffed with meat. The people also enjoy *sancochos* (meat and vegetable stews). Mérida candies, shaped and colored like fruits, are famous. Hot chocolate is almost as popular a drink as coffee in Venezuela.

Beach resorts offer excellent swimming and deep-sea fishing. Big-game hunting is good near Lake Maracaibo and in the Guiana highlands. Most Venezuelan towns have pits for cockfights. Bullfighting also is popular, as are baseball, soccer, tennis, and golf.

Cities. Most of Venezuela's cities have grown up in the northern highlands, on or near the Caribbean Sea coast. A number of the chief cities have port facilities. La Guaira, which lies next to Caracas, serves as the seaport for the capital. Maracaibo, on the shores of Lake Maracaibo, leads in coffee exports. It is the country's second largest city and the center of the petroleum industry. Other leading seaports include Puerto Cabello and Cumaná. There are no major cities south of Ciudad Bolívar, which stands on the banks of the Orinoco River in central Venezuela. Ciudad Guayana, at the junction of the Orinoco and Caroni rivers, was developed as a major industrial city in the 1960's. See the separate articles on Venezuelan cities listed in the *Related Articles* at the end of this article.

Mining. Venezuela ranks among the world's leading petroleum-producing countries. Venezuela's wells yield about 3 million barrels of oil a day, about 5 per cent of the total world supply. Much of Venezeula's oil comes from the Lake Maracaibo area. For many years, foreign companies—mostly from the United States—operated Venezuela's oil wells. The companies and the Venezuelan government shared the profits from the oil. But in 1975, the legislature voted to *nationalize* (give the government full control of) the petroleum industry.

The famous pitch lake of Guanoco lies near the Gulf of Paria. It covers about 1,000 acres (400 hectares) and has the world's largest natural asphalt deposit.

The Guiana highlands contain some of the richest deposits of iron ore in the world. The Bethlehem Steel Corporation began to develop El Pao mountain in 1941. El Pao is believed to contain 70 million short tons (64 million metric tons) of high-grade iron ore. In 1947, the United States Steel Corporation discovered another rich iron-ore deposit in the same area. This deposit is Cerro Bolívar, a mountain 2,631 feet (802 meters) high. Experts believe that Cerro Bolívar is the largest iron-ore deposit in the world. The mountain holds more than 1 billion short tons (0.9 billion metric tons) of high-grade ore.

Venezuela is rich in natural gas, gold, and diamond deposits. Other minerals include manganese, copper, coal, salt, asbestos, bauxite, and sulfur.

Agriculture. More than half the people of Venezuela are agricultural workers. The northern highlands are the major farming region. Venezuela devotes more acreage to corn than to any other crop. But coffee is the most valuable commercial crop. Other crops raised in the country include sugar cane, rice, cotton, sisal, sesame, tobacco, vegetables, fruits, and cacao. Cattle graze on the grass-covered Orinoco plains.

Manufacturing has grown slowly in Venezuela. But now the government helps manufacturers with high

taxes on foreign manufactures, and with money grants. Venezuela produces cotton materials and other textiles, cement, beer, cigarettes, shoes, drugs, refined oil, building materials, fats and oils, and tires and tubes. Modern packing plants prepare beef for local use and for shipment to other countries throughout the world.

Trade. Venezuela trades mostly with the United States. Canada and other members of the Commonwealth of Nations rank next in Venezuelan trade. In 1966, Venezuela joined the Latin American Free Trade Association. Venezuela is one of the world's leading petroleum-exporting countries. Petroleum accounts for 90 per cent of the country's total exports. Iron ore, coffee, and cacao are other leading export items. Major imports include machinery, iron and steel products, textiles, vehicles, chemicals, wheat, and flour.

Transportation and Communication. Venezuela has about 15,000 miles (24,100 kilometers) of roads, more than half of which are hard-surfaced highways. The 583-mile (938-kilometer) Simón Bolívar Highway runs between Caracas and the Colombian border south of Lake Maracaibo. It is the Venezuelan part of the Pan American Highway.

Railroads operate on about 110 miles (177 kilometers) of track in Venezuela. A cable railway more than 11,000 feet (3,350 meters) long connects Caracas with the top of nearby Mt. Avila.

The Orinoco River and its branches provide about 10,000 miles (16,000 kilometers) of navigable rivers. The 5,507-foot (1,679-meter) Angostura Bridge spans the Orinoco at Ciudad Bolívar. It is the longest suspension bridge in South America. Coastal shipping also is important. A concrete bridge 5½ miles (8.9 kilometers) long spans Lake Maracaibo. Several domestic and international airlines serve the country.

Telephone and telegraph lines join most of the cities. Venezuela also has radio and television stations.

Social and Cultural Achievements

Education. The law requires all children to attend primary school from the age of seven until they receive a Primary Education Certificate. Primary schools have six grades. Secondary education is offered in two stages, four-year and one-year. The four-year course resembles a high school course in the United States. The one-year course offers students pre-university training.

Venezuela has 10 universities. The seven state institutions are in Barquisimeto, Caracas, Cumaná, Maracaibo, Mérida, and Valencia. Two private universities and a Roman Catholic school are also in Caracas. The oldest university, Central University of Venezuela, was founded in 1725.

Religion. At least nine out of ten Venezuelans belong to the Roman Catholic Church. But people of all religions are free to worship as they please.

The Arts. Venezuela has two types of arts, the popular and the more formal. In the first type, the Indian, Spanish, and Negro groups have formed a local culture. These local arts include pottery making, weaving, and local dances such as the gay *joropo*. There also are typically Venezuelan musical instruments, such as the *cuatro*, which resembles the old-fashioned guitar, and the *maracas*, made of gourd shells.

Literature, painting, and architecture belong to the more formal arts. Andrés Bello is one of the better-known poets. Others include José Antonio Maitín and José Antonio Pérez Bonalde. Novelists include José Gil Fortoul, Manuel Romero Garcia, Gonzalo Picón Febres, and Rufino Blanco Fombona. Former President Rómulo Gallegos not only was a politician, but also is a well-known novelist. Venezuela's noted artists include Arturo Michelena and Martín Tovar y Tovar. Modern architecture reveals a talent for using brilliant colors as part of the design.

Government

National Government. Venezuela calls itself a republic, but it has spent many of the years since gaining its independence under dictatorship. The constitution, which is not always followed, calls for a president to be elected by direct popular vote every five years.

The Venezuelan Senate has 51 members. The federal district and each of the 20 states sends two representatives to the Senate. If more than 27,000 votes are polled in the federal district, or in one of the states, one extra representative goes to the senate.

The Chamber of Deputies has 133 members. One deputy is elected for every 50,000 persons. States or

Dave Forbert, F.P.G.

University City, the modernistic new campus of Central University of Venezuela, stands on the outskirts of Caracas.

Wide World

Angel Falls, the world's highest waterfall, drops 3,212 feet (979 meters). The falls, in east-central Venezuela, are more than 15 times as high as Niagara Falls in the United States.

territories having less than 50,000, elect only one deputy. All senators and deputies are elected by the people for five-year terms. All citizens over 18 years may vote.

Local Government. The President appoints the governors of the states, Federal District, and two territories. Locally elected councils administer the affairs of the districts and municipalities.

History

Early Days. Alonso de Ojeda (1466?-1515), a Spaniard, led an expedition to Venezuela in 1499, the year after Columbus reached Venezuela. Amerigo Vespucci, for whom America was named, may have been a member of Ojeda's exploring party. Spaniards settled in the country soon after it was first explored.

The settlers fought a long struggle with the warlike Carib Indians of the coastal region. Diego de Losada (c.1520-1569) and other Spanish conquerors pushed inland and waged war with the Teques and other Indian tribes.

In the 1500's, Emperor Charles V of Spain leased the right to settle in Venezuela to the Welser merchant family of Augsburg, Germany. Venezuela thus became the first German colony in the Western Hemisphere. The emperor cancelled the Welser contract in 1546 because the Spaniards protested against letting non-Spaniards settle in the Western Hemisphere. The German colony then returned to Spanish rule.

In the 1600's, English, Dutch, and French pirates attacked Venezuela from the sea. Caracas was attacked and nearly destroyed twice. English pirates referred to the Venezuelan coast as the Spanish Main (see SPANISH MAIN). Venezuela became a Spanish captaincy-general (an administrative unit) in the 1700's.

Struggle for Independence. Francisco de Miranda (1750-1816), a native of Caracas, failed in the first important Venezuelan movement for independence in 1806. Napoleon forced the king of Spain to abdicate in 1808, and replaced him with Joseph Bonaparte. But Venezuela remained loyal to the Spanish throne. In 1810, Venezuela ousted its captain-general, or governor, and replaced him with a *junta* (council) in the name of the king. In 1811, the junta withdrew in favor of a representative congress. The congress declared Venezuelan independence on July 5, 1811. This was the first formal declaration of independence by one of Spain's colonies in the Americas.

Hamilton Wright

The Autopista, or Caracas-La Guaira Expressway, cuts through rocky mountain terrain as it climbs from the seaport of La Guaira to Caracas. The freeway, which is 10½ miles (16.9 kilometers) long, required two twin-tube tunnels and three superbridges to master the steep mountain roadbed.

Miranda became dictator in 1812, but Spanish forces soon captured him. Simón Bolívar, the *Great Liberator*, was left to carry on the struggle for freedom (see BOLÍVAR, SIMÓN). Bolívar suffered defeat and exile, but in 1819, he led his troops over the icy Andes into New Granada (now Colombia) and defeated the Spaniards. He set up the Republic of Great Colombia, including Venezuela, New Granada, and Quito (now Ecuador). Bolívar became president of Great Colombia.

Spanish royalists began a fight against Bolívar in Venezuela in 1821, but Bolívar crushed Spanish power in the area. Venezuela separated from Great Colombia in 1829, and in 1830, set up its own government under President José Antonio Páez (1790-1873).

Strife and Dictatorship. A long period of internal strife followed Bolívar's death in 1830. Páez controlled the country about 20 years. At least five major rebellions broke out against his government. Presidents in the 1850's included José Tadeo Monagas (1784-1868) and his brother José Gregorio Monagas (1795-1858). In 1870, General Antonio Guzmán Blanco (1829-1899) seized power. He ruled Venezuela for almost 20 years.

Venezuela's history has been marked by boundary disputes with every one of its neighbors, but all the controversies have been settled peacefully. In the late 1800's, Venezuela and Great Britain disagreed over the boundary between Venezuela and British Guiana (now Guyana). In 1895, this dispute caused U.S. President Grover Cleveland to send a warning message to the British that created tension between the United States and Great Britain. But Britain and Venezuela reached a settlement in 1899. General Cipriano Castro (1858?-1924) seized the presidency in the same year.

Early 1900's. Castro plunged Venezuela deeply into debt. Germany, Italy, and Great Britain blockaded Venezuelan ports to force the country to pay its debts.

In 1908, Castro went to Europe for surgical treatment. General Juan Vicente Gómez (1857?-1935), Castro's right-hand man, immediately took over the presidency. Gómez ruled as a dictator until his death. Venezuela remained neutral during World War I. Eleazar Lopez Contreras served as president from 1935 to 1941.

Struggle for Power. In 1941, General Isaías Medina Angarita (1897-1952) became president. Venezuela broke diplomatic relations with Germany, Italy, and Japan in 1941, and opened its ports to the Allies during World War II. A revolution broke out in 1945, and a liberal government headed by President Rómulo Betancourt (1908-) took power. Betancourt expanded the constitutional rights of the people. Venezuela became a charter member of the United Nations (UN) in 1945.

In December, 1946, a military group made an unsuccessful effort to seize the government. In 1947, the people chose Rómulo Gallegos (1884-1969) as president. But in 1948, a military group ousted Gallegos. Lieutenant General Carlos Delgado Chalbaud (1909-1950) took over the duties of president. After Delgado Chalbaud's assassination, Germán Suarez Flámerich (1907-) succeeded to the presidency in 1950.

The 1950's. In 1953, Venezuela adopted its 24th constitution since independence. It gave Marcos Pérez Jiménez (1914-), elected president that year, complete governmental power. During his regime, Venezuela invested millions of dollars of petroleum profits in a vast public works program. Industrial expansion, financed the same way, included enlarged iron ore mining along the Orinoco River, and a new hydroelectric power plant on the Caroni River.

Venezuela's political parties formed the Patriotic Junta and rebelled in January, 1958. They forced Pérez Jiménez to resign. He was later charged with taking millions in public funds. He was convicted by Venezeula's Supreme Court 10 years later. In December, 1958, Rómulo Betancourt of the Democratic Action Party became president with a coalition government.

The 1960's. The government began a land reform program in 1960. By 1968, it had distributed over 9 million acres (3.6 million hectares) of land to over 140,000 farmers. Venezuela adopted a new constitution in 1961 that limited the president to a five-year term.

The country broke diplomatic relations with Cuba in 1961. Communists then launched a terror campaign aimed at ousting Betancourt, in which hundreds died. Despite threats by terrorists to harm voters, a record 90 per cent of the population voted in 1963, electing Raúl Leoni (1905-1972), the Democratic Action candidate, president. Rafael Caldera (1916-) of the Christian Democratic Party was elected president in 1968. It was the first time in Venezuela's history that power was transferred peacefully to an opposition party. In 1973, Carlos Andrés Pérez (1922-) of the Democratic Action Party was elected president. W. DONALD BEATTY

Related Articles in WORLD BOOK include:

BIOGRAPHIES

Bolívar, Simón
Miranda, Francisco de
Sucre, Antonio José de

CITIES

Barquisimeto
Caracas
Ciudad Bolívar
La Guaira
Maracaibo
Valencia

PHYSICAL FEATURES

Andes Mountains
Angel Falls
Kukenaam Falls
Lake Maracaibo
Llanos
Orinoco River
Selva

PRODUCTS

Asphalt
Banana
Mining
Petroleum

OTHER RELATED ARTICLES

Bolívar
Columbus, Christopher (Third Voyage to America)
Latin America
Netherlands Antilles
South America
Spanish Main

Outline

I. The Land and Its Resources
II. The People and Their Work
III. Social and Cultural Achievements
IV. Government
V. History

Questions

What has petroleum done for Venezuela? How does the country rank as a petroleum producer?

What are the leading crops? Where are they grown?

What are the country's four geographic regions? How do they differ from each other?

What are the following: *Llaneros? Mestizos?*

Why is Simón Bolívar important in history?

Who can vote in Venezuelan elections? How does Venezuela help illiterates to vote?

What are Venezuela's leading imports and exports?

Why is July 5 an important Venezuelan holiday?

How does the system of Venezuelan government compare with that of the United States?

VENEZUELAN EQUINE ENCEPHALOMYELITIS. See ENCEPHALITIS.

Bruno Pellegrini, Publifoto

Venice occupies about 120 islands off the northeast coast of Italy. In Saint Mark's Square, the heart of the city, a bell tower called the Campanile, *center*, rises above the domed roof of the Cathedral of Saint Mark. The Doges' Palace stands next to the cathedral.

VENICE, *VEHN ihs*, Italy (pop. 363,540), is one of the world's most famous and unusual cities. Venice lies on about 120 islands in the Adriatic Sea and has canals instead of streets. Its people use boats instead of automobiles, buses, taxis, and trucks. Venice also includes part of the Italian mainland.

Fine architecture and priceless works of art have long helped make Venice a major tourist center. The city also ranks as one of Italy's largest ports. Venice is the capital of Venetia, one of the 20 political regions of Italy. The city's name in Italian is VENEZIA.

Venice lies at the north end of the Adriatic Sea, $2\frac{1}{2}$ miles (4 kilometers) off the coast of Italy. For location, see ITALY (political map).

The city's location on the Adriatic made it an important trading center as early as the A.D. 800's. Venice became a strong sea power and gradually built a colonial empire that extended throughout much of the eastern Mediterranean area. At the height of its power, Venice was known as the "Queen of the Adriatic."

Through the years, Venice lost much of its economic and political strength. But the city's art treasures helped it keep its place as a cultural center of the world. Today, floods and polluted air and water threaten to slowly destroy the city. People from many parts of the world have joined various campaigns to save Venice.

The City forms a governmental unit of Italy called a *commune*. The islands of Venice make up the historic center of the city. The modern industrial centers of Marghera and Mestre on the mainland are part of the commune of Venice. See ITALY (Local Government).

A lagoon separates the islands of Venice from the mainland. A roadway over the lagoon carries traffic between the mainland and two of the islands. Automobiles, buses, and trains use terminals on those islands. More than 150 canals take the place of streets on all the islands of Venice, and boats provide transportation. Black, flat-bottomed boats called *gondolas* once served as the chief means of transportation on the islands. Today, motorboats have replaced most of the gondolas (see GONDOLA). More than 400 bridges cross the canals and link the main islands of Venice. Narrow alleyways called *calli* run between the buildings on the islands.

The Grand Canal, the city's main canal, winds through the heart of Venice. Marble and stone palaces built between the 1100's and 1800's stand along both sides of the Grand Canal. The Rialto Bridge crosses the canal in the heart of the city. Venice's chief shopping district lies along the Merceria, a narrow street that runs from the Rialto Bridge to Saint Mark's Square.

Saint Mark's Square is the center of activity in Venice. The Cathedral of Saint Mark, on the east side of the square, ranks as one of the world's outstanding examples of Byzantine architecture (see SAINT MARK, CATHEDRAL OF). A bell tower called the Campanile stands nearby. Buildings in the Renaissance style of architec-

ture rise along the other three sides of the square. Cafes in front of these buildings are favorite meeting places for tourists and for residents of the city. The Doges' Palace, just off the square, was built as a residence for early Venetian rulers called *doges* (see DOGE).

Priceless artworks may be seen in buildings throughout Venice. The Academy of Fine Arts has an outstanding collection of famous paintings, including works by such Venetian masters as Titian, Tintoretto, and Paolo Veronese. The largest theater in Venice, the Fenice, presents operas and plays. Hundreds of students attend Venice's schools of architecture, art, and music. The University of Venice has more than 4,000 students.

Venice has few parks or gardens. But the Lido, a narrow sandbar that borders the islands on the east, is one of Europe's most popular beach resorts.

Venice's location gives the city unique characteristics, but it has also caused serious problems. For example, the islands of Venice are sinking an average of about $\frac{1}{5}$ inch (5 millimeters) yearly. Scientists believe the sinking results partly from the removal of underground water for use by industries. During winter storms, floodwaters sweep through the islands, covering public squares and walkways and damaging buildings. The islands have no sewage system, and so the people dump garbage and other wastes directly into the canals.

The constant exposure to water is weakening the foundations of Venice's buildings. In addition, air pollution is eroding the buildings, as well as many of the city's outdoor art treasures.

The People of Venice's islands are continually affected by the water that surrounds them. The water influences their food and housing as well as their transportation. For example, seafood is the main course of a typical Venetian lunch or dinner. Houses and other buildings do not stand on solid ground but on wooden *piles* (posts) driven into the mud.

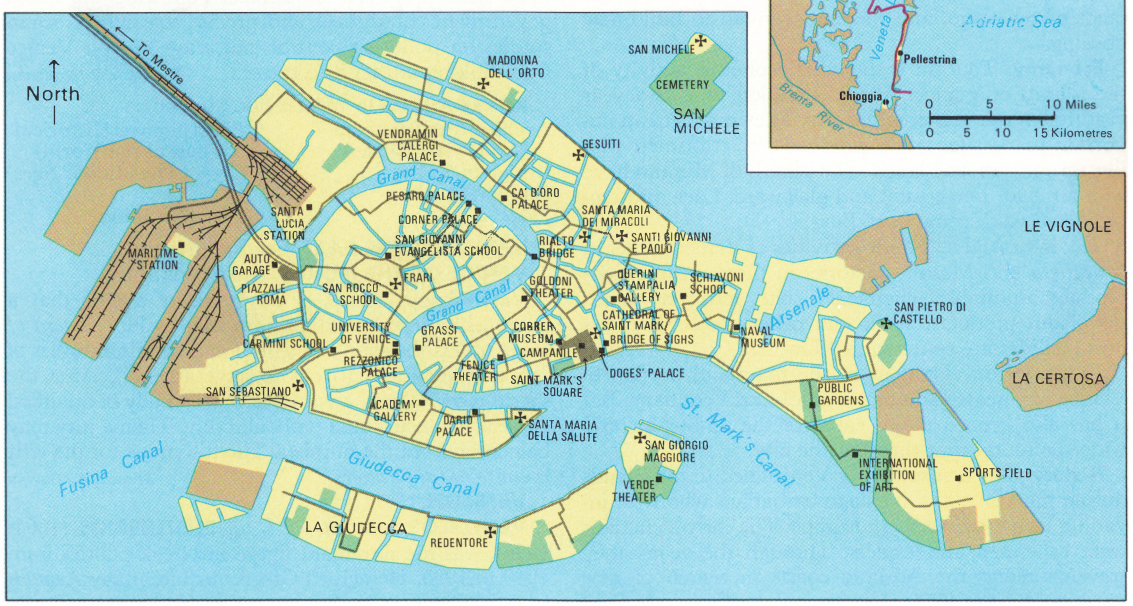
Almost all Venetians are Roman Catholics. Several annual events, in addition to religious holidays, attract large crowds to the city. One of these events, the Feast of the Redeemer, commemorates the end of a plague that struck Venice in 1575. During this all-night festival in July, musicians perform in lighted boats floating along the canals. A *regatta* (gondola race) takes place in September.

Since about 1950, thousands of Venetians have left the islands to live in the mainland communities of Marghera and Mestre. They have moved chiefly because the mainland offers greater job opportunities and a lower cost of living. The modern apartment buildings in Marghera and Mestre also attract many Venetians. Most of the buildings on the islands were erected hun-

CITY OF VENICE

Venice, founded in A.D. 452, was built on islands in the Adriatic Sea. The small map at the right shows the city boundary. The map below locates important historic and artistic sites of Venice.

City boundary
Built-up area
Nonbuilt-up area
Park or garden
Street or alleyway (calli)
Rail line
Airport
Church
Point of interest



WORLD BOOK map

Bullaty/Lomeo, Rapho Guillumette

Canals take the place of streets in Venice, and boats are used for transportation. Most of the buildings that line the canals are hundreds of years old. Bridges link the city's main islands.

dreds of years ago, and there is no room to build new housing.

Economy. Tourism is the chief economic activity of the islands of Venice. About 3 million tourists a year visit the historic center of the city. They make up an important market for goods produced by craftsmen who live on the various islands. The islands of Murano have won fame for fine crystal and glassware. Lace and embroidered work come from Burano.

The industrial and trade activities of Venice center in Marghera and Mestre. Factories in these communities produce aluminum, chemicals, coke, fertilizer, paint, petroleum products, steel, and other goods. Venice's port facilities are centered at Marghera.

Industrial development in the mainland portion of Venice has created thousands of jobs for Venetians. But it has also been a major cause of the serious air and water pollution that threaten the city.

History. The first settlers of Venice fled to the islands during the A.D. 400's to escape barbarians who were invading Italy from northern Europe. The early Venetians were fishermen and traders. Through the years, they traveled along the Adriatic coasts in search of new markets. By the 800's, Venice was trading with Constantinople (now Istanbul) and cities on the Italian mainland and northern coast of Africa. Venice developed into an independent city-state, ruled by nobles.

Venetian ships provided the transportation for the Fourth Crusade, which lasted from 1201 to 1204. The Venetians joined the crusaders in battle and conquered the Byzantine Empire, including Constantinople (see CRUSADES [The Fourth Crusade]). The growing strength of Venice led the city into a series of wars with Genoa, a rival sea power. Venice finally defeated Genoa in 1380 and gained control over trade in the eastern Mediterranean Sea. Venice reached the height of its power during the 1400's, when its colonial empire included Crete, Cyprus, the Dalmatian coast (now part of Yugoslavia), and part of northeastern Italy. Venetian ships carried almost all the silks, spices, and other luxury items that reached Europe from Asia. Venice became a leading center of Renaissance art in the late 1400's and 1500's (see RENAISSANCE).

In the late 1400's, Christopher Columbus journeyed to America and Vasco Da Gama discovered a sea route to India. The center of trade in Europe then shifted to the Atlantic Ocean, and Venice's power slowly declined. The city gradually lost its eastern colonies to the Turks.

In 1797, French forces led by Napoleon Bonaparte occupied Venice. Napoleon divided what was left of the Venetian empire between France and Austria. The city itself came under Austrian control. In 1866, Venice became part of the independent Kingdom of Italy.

The industrialization of Marghera and Mestre began in the early 1900's. During World War II (1939-1945), German troops took over the city. Allied planes bombed the port at Marghera but spared Venice's islands.

In 1966, a disastrous flood that struck much of Italy caused millions of dollars in damage in Venice. The flood badly damaged or destroyed many of the city's paintings and statues. International organizations and private citizens donated money to help pay the repair costs. In addition, the Italian government authorized large relief programs for Venice. Following the flood, government committees and private researchers began studies on pollution control and ways to stop Venice from sinking farther into the sea. EMILIANA P. NOETHER

Related Articles in WORLD BOOK include:

Architecture (picture: Ca' D'Oro Palace)
Bridge of Sighs
Campanile
Doge
Flag (picture: Historical Flags of the World)
Glass (The Middle Ages)
Lace
Venetian Blind

VENICE OF THE EAST. See BANGKOK.

VENICE OF THE NORTH. See STOCKHOLM.

VENIRE, *vee NI ree*, is the name of a writ that a judge issues in preparation for a trial by jury. *A writ of venire* orders the sheriff to summon a certain number of properly qualified citizens to serve as jurors. After the sheriff receives such a writ, he brings a body of qualified citizens into court on a particular day. Then a jury may be chosen from the number. The full name for the writ is *venire facias juratores*. THOMAS A. COWAN

VENISON. See DEER.

VENIZELOS, *VEN uh ZEL us*, **ELEUTHERIOS** (1864-1936), was the dominant figure in Greek politics from 1910 to 1935. He helped Greece acquire many Aegean islands, Crete, and other territories. He brought Greece into World War I in 1917 on the side of the Allies. He prepared for the unsuccessful Greek invasion of Turkey from 1920 to 1922. Venizelos served as prime minister

three times, and persuaded the Greeks to establish a republic. He was born on Crete. See also GREECE (History). R. V. BURKS

VENN DIAGRAM. See SET THEORY (Diagraming).

VENOM is the poison of some snakes and spiders. See SNAKE (Poisonous Snakes; diagram: Venom Glands).

VENOUS BLOOD. See VEIN.

VENTILATION supplies fresh air to indoor places and removes stale air from these places. For people to feel comfortable, they need fresh air free from dust, soot, and odors. The air must not be too warm or too cool, and it must have the right amount of moisture.

Even if the air in a room is fresh to begin with, important changes take place when people come into the room. The air becomes warmer because the human body gives off heat. The amount of moisture in the air increases because of the water vapor given off as people breathe and perspire. Also, the air becomes stale because of perspiration and the oily matter given off from people's skins, noses, throats, and clothing. Smoking especially makes the air stale.

People remove the gas oxygen from the air they inhale, and give off another gas, called *carbon dioxide*, to the air they exhale. Many persons once thought that the carbon dioxide gas breathed out was harmful to anyone who breathed it in again. Although breathing increases the carbon dioxide and decreases the oxygen in a room, these changes are so slight that they have little or no effect on a person's health.

The more people there are in a room, or the harder they work, the faster the air becomes stale. Stale air must be removed and replaced with fresh air. If the air outside is fresh, simply opening a window and perhaps turning on a fan will ventilate the room. But if the outside air is not fresh or the room is on the inside of a building, special equipment is needed to clean the air, cool or heat it, and remove or add moisture. This equipment is called *air conditioning* (see AIR CONDITIONING).

The amount of air required for proper ventilation varies, depending on the room and the number of people in it. Under ordinary conditions, from 10 to 30 cubic feet (0.3 to 0.8 cubic meter) of fresh air must be supplied each minute for each person in the room.

The correct temperature of a room depends on the age of the people in it. For schoolchildren, the temperature should be about 70° F. (21° C). For older persons, it should be about 75° F. (24° C). For elderly persons, it should be about 80° F. (27° C). If the temperature is comfortable, the amount of moisture in the air usually does not affect people. But if it rises above about 75° F., too much *humidity* (moisture) causes discomfort.

Ventilation may also remove harmful materials from the air. In places such as mines or tunnels, poisonous gases may be present which must be removed before men can safely work there. Factories may use ventilation to remove harmful fumes resulting from industrial processes. MERL BAKER

See also ELECTRIC FAN; HUMIDITY; AIR CLEANER.

VENTRICLE. See HEART.

VENTRILOQUISM, *ven TRIL oh kwiz'm*, is the art of projecting, or "throwing," the voice so that it seems to come from a different source. It takes long and steady practice to develop this ability. The sounds are produced in the usual method adopted in talking, but the lips are held as nearly motionless as possible. The tongue is drawn well back and only the tip is moved. A deep breath is taken in and exhaled very slowly. Sounds are modified, or changed, by the muscles of the throat and the palate. Consonants are often changed to avoid lip-moving syllables. For instance, the letter *p* becomes a *k*. *B* is treated in the same way, and is quickly slurred into a *g* or *k*. Lack of facial expression on the part of the performer helps to fool his audience. The performer also constantly directs the attention of his audience to the place from which the sound is supposed to come. Theatrical ventriloquists often use a puppet with whom they pretend to carry on a conversation (see PUPPET).

Ventriloquism is an ancient art. The Greeks thought it was the work of demons. They believed the voice came from the abdominal region. The word ventriloquism comes from the Latin *venter*, meaning *belly*, and *loqui*, meaning *to speak*. GLENN HUGHES

VENTRIS, MICHAEL GEORGE FRANCIS (1922-1956), a British architect, solved one of the great mysteries of archaeology. He deciphered *Linear B*, a language used by the ancient Greeks about 3,500 years ago. Inscriptions in Linear B were first found on clay tablets discovered at Knossos, Crete, about 1900. But all efforts to decipher them failed until Ventris, an amateur cryptographer, succeeded in 1953. He proved that Linear B was Greek written in the alphabet used by the Minoans, the people of ancient Crete. As a result, scholars changed their views about the early history of ancient Greece. Ventris was born at Wheathampstead, England.

See also GREECE, ANCIENT (Helladic Civilization); AEGEAN CIVILIZATION.

VENTURI. See CARBURETOR.

VENUS was a major goddess in Roman mythology. She originally was the goddess of love and beauty, but later she also symbolized the creative force that sustains all life. Cupid, the Roman god of love, was her son. Venus closely resembled the Greek goddess Aphrodite.

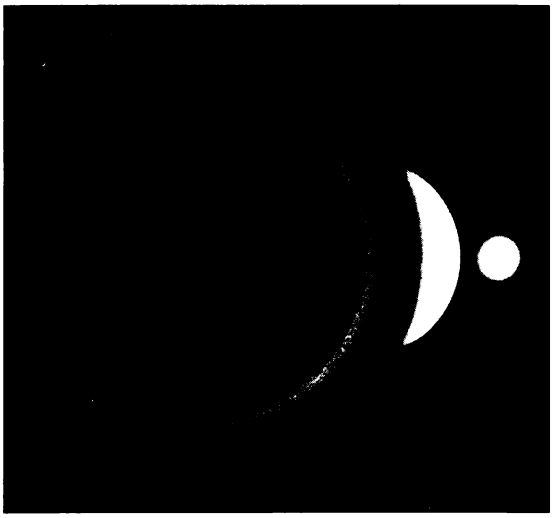
Venus was also the mother of Aeneas, an ancestor of the legendary founders of Rome. The Romans worshiped her because of her association with the city's early history. They dedicated some of Rome's most important temples to her. They believed the family of the ruler Julius Caesar descended from Venus.

Venus was born full-grown from the foam of the Mediterranean Sea. She married Vulcan, the lame and ugly blacksmith god. Venus had a love affair with Mars, the god of war, and she also fell in love with Adonis, a mortal.

Venus plays an important part in a famous myth called the Judgment of Paris. Venus and the goddesses Juno and Minerva all claimed a golden apple, a prize reserved for the most beautiful goddess. To settle the argument, the god Jupiter ordered Paris, the son of King Priam of Troy, to choose the most beautiful of the three. Paris awarded the apple to Venus. In revenge, Juno and Minerva made certain that Troy was destroyed during the Trojan War.

Venus has been a popular subject of painters. Many paintings show her admiring herself in a mirror. Others portray the Judgment of Paris or show Venus with Mars or Adonis. PAUL PASCAL

See also APHRODITE; ADONIS; PARIS (in mythology); VENUS DE MILO; PAINTING (picture: *Birth of Venus*).

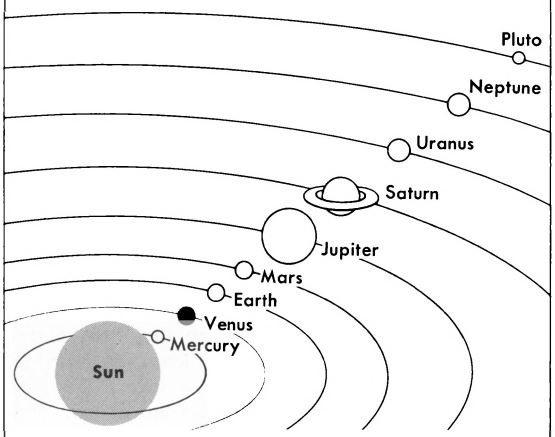


Lowell Observatory

The Phases of Venus can be seen through a telescope. The planet appears as a large halo when on the same side of the sun as the earth. It looks like a crescent as it moves away from the earth, and like a small disk when near the opposite side of the sun.

VENUS AT A GLANCE

Venus, shown in blue in the diagram, is the second closest planet to the sun. Astronomers sometimes use the ancient symbol for Venus, *right*.



Distance from Sun: *Shortest*—66,800,000 mi. (107,500,000 km); *Greatest*—67,700,000 mi. (109,000,000 km); *Mean*—67,250,000 mi. (108,230,000 km).

Distance from Earth: *Shortest*—25,000,000 mi. (40,200,000 km); *Greatest*—160,000,000 mi. (257,000,000 km).

Diameter: 7,570 mi. (12,180 km).

Length of Year: 225 earth-days.

Rotation Period: 243 earth-days.

Average Temperature: 800° F. (427° C).

Atmosphere: Carbon dioxide, nitrogen, argon, water vapor.

Number of Satellites: None.

VENUS is known as the earth's "twin" because the two planets are so similar in size. The diameter of Venus is about 7,570 miles (12,180 kilometers), about 360 miles (579 kilometers) smaller than that of the earth. No other planet comes closer to the earth than Venus. At its closest approach, it is about 25,000,000 miles (40,200,000 kilometers) away.

As seen from the earth, Venus is brighter than any other planet or even any star. At certain times of the year, Venus is the first planet or star that can be seen in the western sky in the evening. At other times, it is the last planet or star that can be seen in the eastern sky in the morning. When Venus is near its brightest point, it can be seen in daylight. Ancient astronomers called the object that appeared in the morning Phosphorus, and the object that appeared in the evening Hesperus (see EVENING STAR). Later, they realized these objects were the same planet. They named Venus in honor of the Roman goddess of love and beauty.

Orbit. Venus is closer to the sun than any other planet except Mercury. Its mean distance from the sun is about 67,250,000 miles (108,230,000 kilometers), compared with 93,000,000 miles (150,000,000 kilometers) for the earth and 36,000,000 miles (57,900,000 kilometers) for Mercury.

Venus travels around the sun in a nearly circular orbit. The planet's distance from the sun varies from about 67,700,000 miles (109,000,000 kilometers) at its farthest point to about 66,800,000 miles (107,500,000 kilometers) at its closest point. The orbits of all the other planets are more *elliptical* (oval-shaped).

Venus takes about 225 earth-days, or about $7\frac{1}{2}$ months, to go around the sun once, compared with 365 days, or one year, for the earth.

Phases. When viewed through a telescope, Venus can be seen going through "changes" in shape and size. These apparent changes are called *phases*, and they resemble those of the moon. They result from different parts of Venus' sunlit areas being visible from the earth at different times.

As Venus and the earth travel around the sun, Venus can be seen near the opposite side of the sun about every 584 days. At this point, almost all its sunlit area is visible. As Venus moves around the sun toward the earth, its sunlit area appears to decrease and its size seems to increase. After about 221 days, only half the planet is visible. After another 71 days, Venus nears the same side of the sun as the earth, and only a thin sunlit area can be seen.

Venus is at its closest point to the earth when it is on the same side of the sun as the earth. Although its sunlit half faces away from the earth at this point, Venus is still visible as a thin halo. As Venus moves away from the earth, its sunlit area increases for about two months, and then decreases as the planet moves toward the opposite side of the sun.

When Venus is moving toward the earth, the planet can be seen in the evening sky. When moving away from the earth, it is visible in the early morning sky.

Rotation. As Venus travels around the sun, it rotates slowly on its axis, an imaginary line drawn through

The contributor of this article is Hyron Spinrad, Professor of Astronomy at the University of California in Berkeley.

its center. Venus' axis is not *perpendicular* (at an angle of 90°) to the planet's path around the sun. The axis tilts at an angle of about 10° from the perpendicular position. For an illustration of the tilt, see PLANET (The Axes of the Planets). Venus is the only planet that does not rotate in the same direction that it travels around the sun. It rotates in the *retrograde* (opposite) direction. Venus spins around once every 243 earth-days.

Surface and Atmosphere. Although Venus is called the earth's "twin," its surface conditions appear to be entirely different from those of the earth. Astronomers have had difficulty learning about the surface of Venus because the planet is always surrounded by thick clouds. They have used radar and radio astronomy equipment to "explore" Venus, and to form some idea of conditions on the planet.

The surface of Venus is probably very hot, dry, and dusty. Dust and sand blown by strong winds are believed to have worn away much of the surface, making it rather smooth and flat. But radar measurements indicate that a part of the surface is rough, or possibly mountainous. There is no water on Venus' surface, because the high surface temperature would make it boil away.

The atmosphere surrounding Venus is heavier than that of any other planet. It appears to consist mainly of carbon dioxide, with nitrogen and a small amount of hydrogen and water vapor. The *atmospheric pressure* (force exerted by the weight of the gases) on Venus is estimated at 294 pounds per square inch (21 kilograms per square centimeter), compared with about 14.7 pounds per square inch (1.03 kilograms per square centimeter) on the earth.

Many astronomers think Venus' atmosphere contains large amounts of water vapor, and that some of the clouds around the planet consist of water vapor. But only small amounts of water vapor have been discovered.

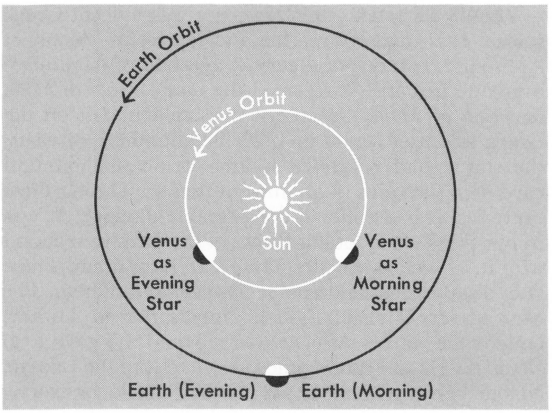
The plants and animals that live on the earth could not live on Venus, because of the high temperature and the lack of oxygen. Astronomers do not know whether any form of life exists on Venus.

Before scientists began using radio telescopes and radar to study the planets, there were many ideas about conditions on Venus. Some astronomers thought the planet had a wet, swampy surface and a steamy atmosphere, with water clouds. Others thought the surface was a vast ocean of water containing dissolved carbon dioxide gas. A third group pictured the planet as an ocean of oil, with oil droplets in the clouds. At least part of each of these theories has been proved wrong.

Temperature. The average temperature on Venus is over 800° F. (427° C), higher than that of any other planet. Temperatures of areas facing the sun may rise above 980° F. (527° C). The dark side of the planet is rarely cooler than 600° F. (316° C).

The temperatures on Venus are much higher than had been predicted. Most astronomers thought the thick clouds surrounding Venus reflected much of the sun's energy. If the clouds did this, the surface temperatures would be similar to those on the earth. Instead, much of the sun's energy seems to filter through the clouds and be trapped by the thick atmosphere. Hardly any energy appears to escape from the atmosphere into space. The trapped energy causes the high surface temperatures of the planet.

By letting the sun's energy filter into Venus' atmosphere, but preventing it from escaping, the clouds work in the same manner as a greenhouse. For this reason, astronomers call Venus' heating method the *greenhouse effect*. Some scientists believe the planet's atmosphere contains a large amount of water vapor that traps the energy and causes the greenhouse effect.



Venus Appears in the Evening Sky when moving toward the earth. It is in the morning sky after it has passed between the sun and the earth and begins moving away from the earth.

Mass and Density. The *mass* of Venus is about four-fifths that of the earth (see MASS). The force of gravity on Venus is slightly less than on earth. An object weighing 100 pounds on earth would weigh about 89 pounds on Venus. Venus is also slightly less *dense* than the earth (see DENSITY). A portion of Venus would weigh a little less than an equal-sized portion of earth.

Flights to Venus. Venus was the first planet to be observed by a passing spacecraft. The unmanned U.S. spacecraft *Mariner II* passed within 21,600 miles (34,760 kilometers) of Venus on Dec. 14, 1962, after traveling through space for over $3\frac{1}{2}$ months.

Mariner II made various measurements of conditions on and near Venus. It sent these measurements back to the earth by radio. Instruments in the spacecraft measured the high surface temperatures of Venus. Other measurements showed that Venus has either a very weak magnetic field, or possibly no magnetic field.

Two unmanned Russian spacecraft "explored" Venus in 1966, *Venera 2* passed within 25,000 miles (40,200 kilometers) of the planet on February 27, and *Venera 3* crashed into Venus on March 1.

In October, 1967, spacecraft from both the United States and Russia reached Venus. On October 18, the Russian spacecraft *Venera 4* dropped a capsule of instruments into Venus' atmosphere by parachute. On October 19, the U.S. spacecraft *Mariner V* passed within 2,480 miles (3,991 kilometers) of Venus. Both probes reported large amounts of carbon dioxide in the planet's atmosphere. On Dec. 15, 1970, the Russian spacecraft *Venera 7* landed on Venus. The U.S. planetary probe *Mariner X* flew near Venus on Feb. 5, 1974. It photographed the clouds in Venus' atmosphere and then continued on to Mercury. *Mariner X* was the first probe to study two planets. HYRON SPINRAD

See also PLANET; SOLAR SYSTEM; SPACE TRAVEL.

VENUS DE MILO, *MEE loh*, is a magnificent Greek statue. It is made of marble and represents Venus, or Aphrodite. It is one of the great treasures of the Louvre museum, in Paris. It received the name *Venus de Milo*, or *Venus of Melos*, because a peasant found it on the Greek island of Melos in 1820. For hundreds of years, the statue had remained hidden in an underground cave near the ruins of an ancient theater. During these centuries, it had suffered considerable damage. It was in two parts when found. Pieces of the arms were found with it, as well as a pedestal with an inscription. These later disappeared, and no one has ever found them. The Marquis de Rivière, French ambassador to Turkey, bought the statue. After it was repaired, he gave it to Louis XVIII of France, who presented it to the Louvre. No one knows who made the Venus de Milo, or exactly when. It was probably made during the first or second century B.C., under the influence of a master whose work belonged to an earlier, greater period of Greek art. See also WORLD (picture: Art Museums). FLORENCE HOPE

VENUS'S-FLYTRAP, or DIONAEA, *DI oh NE uh*, is a plant found in a small area of the coastal regions of North and South Carolina. It traps insects in its leaves and digests them. Because of this habit it is called a *carnivorous* (meat-eating) plant. Venus's-flytrap grows in bogs in which the soils lack available nitrogen, and thus the insects take the place of nitrogen in the plant's diet. This plant is sometimes grown in greenhouses as a curiosity. It does best in a damp atmosphere but needs sunshine.

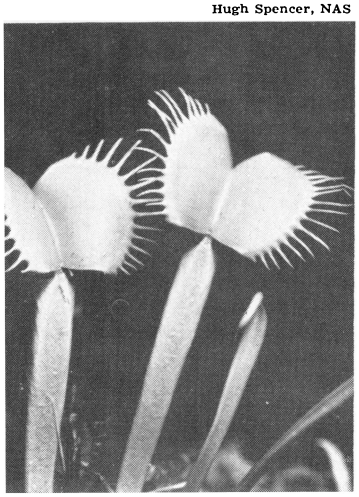
Venus's-flytrap grows about 1 foot (30 centimeters) high. It bears a cluster of small, white blossoms at the top of the flower stalk. The blossoms rise from a tuft of oddly shaped leaves. The leaves have two parts—a lower bladelike portion and an upper part with two lobes hinged to a rib. The surface of each lobe has three sensitive hairs, and the edges are fringed with sharp bristles.

When an insect lights on one of these hairs, the two lobes of the leaves close like a trap and hold the insect inside. The soft parts of the insect are digested by a fluid secreted by special glands of the leaf. After the plant has taken in the food, the trap opens, and the leaf is in position for another victim. When a leaf has caught several insects, it withers and dies.

Scientific Classification. Venus's-flytrap belongs to the sundew family, *Droseraceae*. It is classified as genus *Dionaea*, species *D. muscipula*. THEODOR JUST

See also PLANT (picture: Plants That Eat Insects).

Hugh Spencer, NAS



The Venus's-Flytrap snares insects in its leaves. A fluid secreted by glands in the leaves enables the plant to digest its victims.

VENUS'S-GIRDLE. See CTENOPHORE.

VERACRUZ, *VAIR uh KROOZ*, or *BAY rah KROOS*, has the second largest population of any Mexican state, 3,815,422 persons. Only the state of México has more people. Veracruz covers 28,114 square miles (72,815 square kilometers), and has a 430-mile (692-kilometer) coastline on the Gulf of Mexico (see MEXICO [political map]). Jalapa is the capital. Oil wells in Veracruz produce about two-thirds of Mexico's petroleum. The largest city, Veracruz, is Mexico's chief port. Veracruz was one of the original states of Mexico. See also OLMEC INDIANS; ORIZABA. CHARLES C. CUMBERLAND

VERACRUZ (pop. 214,072), officially VERACRUZ LLAVE, *YAHvay*, is the chief port of Mexico. The city overlooks a fine harbor on the Gulf of Mexico, 200 miles (320 kilometers) east of Mexico City. For location, see MEXICO (political map). The city's products include cement, chocolate, cigars, flour, seafood, shoes, and textiles.

Hernando Cortes founded Veracruz in 1519 (see CORTES, HERNANDO). The city was the first Spanish settlement in Mexico. The United States Army captured the city in 1847 during the Mexican War. The French occupied it during their invasion of Mexico in the 1860's. United States Marines occupied Veracruz for a short time in 1914, after a dispute with Mexico over the arrest of a group of American sailors. JOHN A. CROW

VERB is a part of speech that expresses an action or a state of being. A verb may consist of one word, such as *send*, or a group of words, such as *has been sending*. Verbs occupy characteristic positions in a sentence. For example, only a verb makes sense in the blank spaces in the following sentences:

She _____ *the letter.* (*sent, began*)
The letter _____ *long.* (*was, seemed*)
He _____ *my father.* (*is, answered*)
We _____ *immediately.* (*went, arrived*)
Did they _____ *?* (*go, begin*)

Some words, such as *theft* and *loneliness*, express an action or a state of being but are not verbs. These words are nouns. They cannot be used in the verb position of a sentence. In addition, they do not possess other features of verbs called *formal characteristics*.

Formal Characteristics of verbs can be illustrated by the different forms of the verb *fall*. These forms are *fall, falls, fell, fallen*, and *falling*. *Fall* is the base form, or infinitive, with or without the preceding particle *to*. *Fall* is also the form of the first and second person singular and plural, as in *I fall, you fall, we fall*. *Falls* is the form of the third person singular, used with a noun or a pronoun subject. *Fell* is the past tense form. *Fallen* is the past participle. It is used after an auxiliary verb, such as *be* and its forms (*am, is, are, was*, and *were*) or *have* and its forms (*has* and *had*). It is also used alone when the verb is used as a modifier, as in Fallen *leaves covered it*. *Falling* is the present participle, used as a modifier, as in *The* falling *snow blinded him*, and after forms of *be*, as in *He was* falling.

Auxiliary Verbs, such as *can, may, should, might*, and *must*, do not have the same characteristics as other verbs. They are usually followed by the base form of a verb, as in *John* can *go but Peter* must *stay*. The verbs *do, be*, and *have* serve a double function. They may be used as independent verbs (*He has it*) and also as auxiliary verbs (*She has tried*).

Regular and Irregular Verbs are classified according to the way they form the past tense and past participle. A verb's base form, past tense form, and past participle are called its *principal parts*.

Most English verbs are regular. The past tense form and the past participle of a regular verb are created by adding *-ed* to the base form, as in *happen, happened, happened*. The principal parts of all verbs of recent origin are formed by adding *-ed* to the base form: *computerize, computerized, computerized; televise, televised, televised*.

Irregular verbs change in other ways to form the past tense and past participle. One kind of irregular verb changes in the past tense and then keeps that same form in the past participle. Examples include *feed, fed, fed;* and *win, won, won*. Another kind adds an *-n* or *-en* to the base form or to the past tense form to make the past participle. Examples include *know, knew, known;* and *speak, spoke, spoken*. Other verbs have irregular changes in spelling for each principal part, as in *slay, slew, slain*. Still others use the same form for all principal parts. They include *cost, cut, set,* and *shut*. These verbs are called *invariables*.

A large group of irregular verbs shows a change of vowel in both the past tense and past participle: *begin, began, begun; swim, swam, swum*. Through usage, many verbs of this type are gradually changing into regular verbs with *-ed* endings. For example, the verb *strive* has the irregular forms *strive, strove, striven* and also has the regular forms *strive, strived, strived*.

Transitive and Intransitive Verbs. Verbs may be classified as either transitive or intransitive. A transitive verb has an object, as in *He found the money*. The object of *found* is *money*. An intransitive verb has no object, as in *She is speaking*. Many verbs may be transitive in one sentence and intransitive in another. For example, *The chorus sang a popular song* (transitive); *The chorus sang well* (intransitive).

Linking, or Copulative, Verbs occur in two general structures. In one, the verb is followed by an adjective, as in *He is good* or *It smelled good*. Verbs such as *seemed, looked, tasted, smelled, became, sounded, turned,* and various others can be used as linking verbs. In the other linking-verb structure, a noun following the verb refers to the subject, as in *She* is *my mother; He* became *mayor;* and *She* seemed *an interesting person*. In American English, *be, become, remain,* and *seem* are the only verbs commonly used in this construction. British English uses a few others.

Finite and Nonfinite Verbs. A finite verb, together with a subject, can form a grammatically complete sentence: *She drives; She is driving*. A nonfinite verb, or *verbal*, is derived from a verb but acts as another part of speech. There are three forms of verbals: *gerunds, participles,* and *infinitives*. A gerund is used as a noun: Swimming *is fun*. Participles serve as adjectives: *Susan held the* winning *ticket*. Infinitives can be used as nouns, adjectives, or adverbs. In the sentence *To run a mile is difficult*, the infinitive *to run* serves as a noun. In the sentence *I have reading to do*, the infinitive *to do* is used as an adjective. In the sentence *Alice practiced to become a better singer*, the infinitive *to become* serves as an adverb.

Nonstandard Usage of Verbs involves the use of verb forms that are not suited to the rest of a sentence. Such usage occurs mainly in two ways. One way consists of dropping a standard verb ending: *He fall* instead of *He falls*. The other common nonstandard practice involves using an inappropriate principal part: *I seen it* instead of *I saw it*.

WILLIAM F. IRMSCHER

Related Articles in WORLD BOOK include:

Conjugation	Inflection	Participle	Tense
Gerund	Mood	Person	Voice
Infinitive	Number	Sentence	

VERBENA, *ver BE nuh*, is the name of a group of plants in the vervain family which grow both wild and in the garden. Various kinds of verbena grow from the tropics to the North Temperate Zone. The wild plants, usually called *vervains*, grow in moist meadows. They bloom from June to September.

In tropical countries, some species grow as tall as trees, but those in the temperate climates range from about 3 inches (8 centimeters) to over 4 feet (120 centimeters) in height. Almost all of them have four-sided stems, and opposite or alternate leaves. Several wild European species have been introduced into America and are troublesome weeds in many parts of the United States.

J. Horace McFarland

Verbena Flowers

Many cultivated verbena have flower clusters of pink, red, white, purple, or any other color except yellow. They are grown as annuals in the northern states. The seeds are planted in pots under glass in the winter. They can also be grown from cuttings. They may be grown in the open in the deep South, and will bloom early in the spring. *Moss verbena* is used for hanging baskets.

Scientific Classification. Verbenas belong to the vervain family, *Verbenaceae*. The common garden plant is genus *Verbena*, species *V. hybrida*. The moss verbena is *V. tenuisecta*.

VERDANDI. See NORNS.

VERDE, CAPE. See CAPE VERDE.

VERDE ISLANDS, CAPE. See CAPE VERDE ISLANDS.

VERDI, GIUSEPPE (1813-1901), was an Italian composer of operas. His works are performed more often today than those of any other opera composer. Between 1851 and 1871, Verdi produced a remarkable series of masterpieces, including *Rigoletto* (1851), *Il Trovatore* (1853), *La Traviata* (1853), *The Sicilian Vespers* (1855), *Simon Boccanegra* (1857, revised 1881), *A Masked Ball* (1859), *La Forza del Destino* (1862), *Don Carlos* (1867), and *Aida* (1871). Verdi wrote 25 operas. He composed all to Italian *librettos* (texts) except the *Sicilian Vespers* and *Don Carlos*, which he wrote to French librettos.

Verdi gained fame for his mastery of theatrical effect and for the stirring melodic quality of his operas. He took several of his plots from the plays of such great dramatists as Victor Hugo, Friedrich Schiller, and William Shakespeare. Many of the melodies he wrote for soloists, small groups of singers, and choruses remain familiar throughout the world.

Verdi, a fiery Italian patriot, became a symbol of

Italy's struggle for independence from Austria in the mid-1800's. He had frequent conflicts with Austrian authorities, who felt that his operas encouraged Italian nationalism. Much of the music of his early operas, particularly of *I Lombardi* (1843), became identified with the Italian nationalist movement.

Verdi was born in the village of Le Roncole near Parma. He began studying music as a boy in Busseto, a nearby town. He tried to enter the Milan Conservatory in 1832 but was refused admission because he was too old and lacked sufficient formal training. He began taking private music lessons in Milan.

In 1839, Verdi's first opera, *Oberto*, was a success at its première at La Scala, the leading opera house in Milan. Between 1838 and 1840, Verdi's first wife and two small children died. The grief-stricken composer finished a comic opera, *Un Giorno di Regno*, which was a failure when presented in 1840. But with the success of his third opera, *Nabucco* (1842), Verdi became the foremost Italian composer of his time.

Ewing Galloway

Giuseppe Verdi

After completing *Aida* in 1871, Verdi apparently decided to end his career because of illness and age. During the next 16 years, his only important composition was a *Requiem Mass* (1874), written in memory of the Italian author Alessandro Manzoni.

Verdi returned to opera composing in the mid-1880's through the urging of his friend Arrigo Boito, a noted Italian poet and composer. Boito contributed librettos for Verdi's *Otello* (1887) and *Falstaff* (1893). Many critics have called *Otello* Verdi's greatest tragic opera, and some consider it the greatest of all Italian operas. *Falstaff* was only Verdi's second comic opera, but it ranks as one of the greatest comic operas ever written. See BOITO, ARRIGO.

Verdi's only works after *Falstaff* were four beautiful religious compositions for voices called *Quattro Pezzi Sacri* (1898). A period of national mourning was declared in Italy following his death. HERBERT WEINSTOCK

See also OPERA (Giuseppe Verdi).

VERDIGRIS, *VUR dih grees*, or *VUR dih gris*, is a poisonous pigment produced by the action of acetic acid on copper. The color of this pigment varies from blue to green. Verdigris is used commercially in dyeing, calico printing, the manufacture of Paris green, and the manufacture of paint. Because the pigment is likely to fade and react chemically with other substances, it is used less often than in the past. Verdigris is sometimes used in the making of liniments and salves. It must never be taken internally because it is highly poisonous. In case of poison from verdigris, the antidote is milk and white of egg. See also ACETIC ACID.

VERDIN, or GOLDTIT, is a small, yellow-headed bird of the titmouse family. It is about $4\frac{1}{2}$ inches (11 centimeters) long and lives in the arid portions of Texas and the southwestern United States and in Mexico. Its body is ash-colored and the breast is lighter. The verdin's nest is often large, and is shaped like a ball. It is made of twigs and built in a thorny tree. The female lays from four to six eggs, which are pale blue with brown specks. The birds are too small to fight to protect their young, but their thorny nests give ample protection against most enemies, especially since they leave only a small opening on the bottom as an entrance. Sometimes, they build a "porch" around the opening to hide it. They eat caterpillars and other small insects.

Cruickshank, National Audubon Society

The Verdin builds its nest of twigs in a thorny tree. The scratchy thorns protect the eggs and young birds from enemies.

Scientific Classification. The verdin is a member of the titmouse family, *Paridae*. It is classified as genus *Auriparus*, species *A. flaviceps*. LEONARD W. WING

VERDUN, *vair DUHN*, Quebec (pop. 74,718), a suburb of Montreal, lies on the Island of Montreal on the north bank of the St. Lawrence River. Verdun adjoins the southeast section of Montreal. For Verdun's location, see QUEBEC (political map).

Parks, gardens, and recreational areas line the city's river front. Verdun has about 20 public schools. It was incorporated as a village in 1875. Verdun became a town in 1907, and a city in 1912. The city has a council-manager government. MURRAY G. BALLANTYNE

VERDUN, BATTLES OF. Verdun, one of the oldest cities of France, has been a battleground ever since Attila the Hun ravaged it in A.D. 450. This city on the Meuse River in northern France is about 50 miles (80 kilometers) from the German border. It has often played an important part in resisting enemy invasion.

The most famous battle took place during World War I. On Feb. 21, 1916, German troops launched a surprise attack, expecting to crush Verdun in a few days. The Germans hoped that, by capturing a key to the French line, they would damage French morale, and could easily defeat other French armies. They also hoped to impress German allies and neutral nations. The French, led by General Henri Pétain, defended the area stubbornly. After 11 months, the Germans withdrew. Many French and German troops died because of inept generalship, but the French hailed Pétain as a hero (see PÉTAIN, HENRI P.). During World War II, German forces easily captured Verdun in 1940, and U.S. forces recaptured it in 1944. STEFAN T. POSSONY

VERDUN, TREATY OF, divided Charlemagne's empire into three parts. Charlemagne's grandsons fought over control of the empire after their father died in 840, and finally signed the treaty in 843. Charles the Bald received most of what is now France. Louis the German took almost all the land east of the Rhine, which became modern Germany. Lothair kept the title of emperor, and ruled a strip of land in the middle, from the North Sea to central Italy. As a result of the treaty, the lands that were to become France and Germany were effectively divided. The section in between remained a battleground for a thousand years. Italy soon fell away from Lothair's kingdom. In later years, part of his kingdom became known as *Lotharingia*, or, later, Lorraine. The partition agreed upon at Verdun marked the end of the political unity of the Christian countries of Western Europe. EDWIN J. WESTERMANN

VEREENIGING, TREATY OF. See BOER WAR.

VÉRENDRYE, SIEUR DE LA. See LA VÉRENDRYE, SIEUR DE.

VERGA, GIOVANNI (1840-1922), was an Italian novelist, playwright, and short-story writer. His style—dry, matter-of-fact, and impersonal, yet highly effective—influenced many later Italian writers.

Verga was born in Catania, Sicily, and his best work deals with Sicily and its people. In *The House by the Medlar Tree* (1881), Verga described the struggle of a family of Sicilian fishermen to keep their home and integrity despite tragedy and disaster. Verga planned it as the first of five novels describing man's unsuccessful efforts to improve his life. The project ended with the second novel, *Mastro-don Gesualdo* (1888).

Verga's literary success began in 1866 with the publication of the first of several romantic novels of middle-class life. He also wrote several short stories set in Sicily. His collection *Life of the Fields* (1880) includes "Cavalleria Rusticana," which Verga adapted into a play. This tale became the basis of an opera by Pietro Mascagni. SERGIO PACIFICI

VERGIL. See VIRGIL.

VERLAINE, *vair LEHN*, **PAUL** (1844-1896), was a French poet born in Metz. He began his career with *Fêtes Galantes* (1869), impressionistic sonnets inspired by the paintings of Antoine Watteau. Verlaine's short poem "Art Poetique" (1871-1873) expressed the spirit of the symbolist movement. In it, he claimed that the suggestive power of music was the essential quality of poetry. See SYMBOLISM.

Verlaine traveled through Great Britain, The Netherlands, and Belgium with the teenage poet Arthur Rimbaud in the early 1870's. Verlaine described the landscapes in dream imagery in *Romances sans Paroles* (*Romances Without Words*, 1874). The friendship ended in 1874 when Verlaine shot and wounded Rimbaud during a quarrel. After Verlaine served a brief prison term for the shooting, he wrote *Sagesse* (*Wisdom*, 1881), poems of self-searching and religious repentance.

Verlaine's many spontaneous and melodious verses—with their images of gray skies, pale moons, and weeping violins—create a melancholy mood. ANNA BALAKIAN

VERMEER, *vuhr MEER*, **JAN** (1632-1675), was a Dutch painter. He was often called Vermeer van Delft to distinguish him from the painter Jan Vermeer van Haarlem. Most of Vermeer's paintings show young, middle-class people, alone or in small groups, in simply furnished rooms. They sit or stand before light walls, illuminated from a window. His painting *Young Woman with a Water Jug* appears in color in the PAINTING article.

Officer and Laughing Girl (about 1660), an oil painting on canvas; © The Frick Collection, New York City

A Typical Vermeer Painting shows a quiet scene of middle-class domestic life illuminated by sunlight from an open window.

There is always an air of quiet and timeless happiness in Vermeer's canvases. The light is clear and soft, and the outlines of all forms seem slightly blurred. His favorite colors, blue and yellow, make a lovely, cool harmony. His two outdoor scenes are among the finest landscapes of the 1600's. Vermeer's works include *The Milk Maid*, *The Artist in His Studio*, and *View of Delft*. He was born in Delft, and spent his entire life there. Vermeer was a painstaking worker, and he painted only about 40 known pictures. JULIUS S. HELD

VERMES. See WORM.

VERMICELLI. See MACARONI.

VERMICULITE, *vur MIHK yuh lyt*, is a clay mineral which looks like mica. It is found as laminated flakes. In the United States, it is mined chiefly in Montana and South Carolina. When expanded by heat, vermiculite can be used industrially in building materials for insulation and soundproofing. CECIL J. SCHNEER

VERMIFORM APPENDIX. See APPENDIX, VERMIFORM.

VERMILION, *vuhr MIHL yuhn*, is a pigment or coloring matter used in making paint. Its color varies from crimson to a brilliant yellow-red. Formerly made from the mineral cinnabar, it is now made from mercury and sulfur ground together and treated with caustic-potash solution. This may be heated and stirred to form a black sulfide which yields the pigment, after long steaming. The name *vermilion* comes from a Latin word meaning *little worm*, and refers to the dried bodies of insects from which carmine, another red dye, is obtained. See also CARMINE; CINNABAR. THOMAS MUNRO

VERMILION RANGE. See MINNESOTA (Economy).

Grant Heilman
Vermont Village in Winter

VERMONT

THE GREEN MOUNTAIN STATE

VERMONT, a New England state, is famous for its Green Mountains. These tree-covered peaks run the entire length of central Vermont. They divide the state into eastern and western sections. The beauty of the Green Mountains helps make Vermont one of the most scenic states. Every year, the mountains attract thousands of skiers and other tourists. Montpelier is the capital of Vermont, and Burlington is the largest city.

Manufacturing is the chief economic activity in Vermont, as it is in all the other New England states. But farming is also important in Vermont—much more so than in the rest of New England. Vermont is the only New England state in which farm products account for more than a fifth of the value of all goods produced.

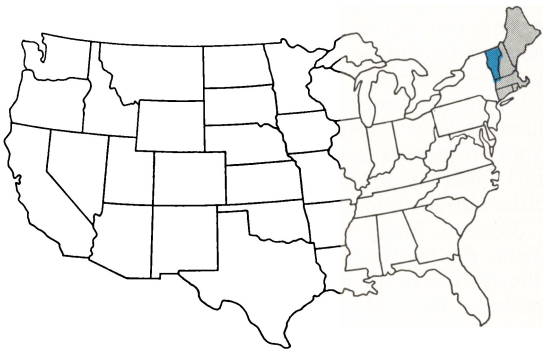
Vermont has the lowest percentage of city dwellers of any state in the United States. Only two Vermont cities have more than 15,000 persons. They are Burlington and Rutland. Vermont has the smallest population of any state east of the Mississippi River. It ranks 48th among all the states in population. Only Alaska and Wyoming have fewer persons.

Forests cover about three-fourths of Vermont, and a variety of mineral deposits lie under the ground. These natural resources provide the raw materials for two of the state's main manufacturing industries—wood processing and stone processing. Trees from Vermont's forests supply wood for making paper, furniture, and many other products. Vermont granite and marble are used in buildings, memorials, and tombs. Slate is used for roofing and for other purposes.

Vermont is the only New England state without a coastline on the Atlantic Ocean. However, water borders more than half the state. The Connecticut River forms Vermont's entire eastern border. Lake Champlain extends along the northern half of the western border of Vermont. In addition to the Green Mountains, Vermont has many other mountains and hills. These include the Granite Hills and the Taconic Mountains.

Maple Sugar Season in Groton

Vermont (blue) ranks 43rd in size among all the states, and 2nd in size among the New England States (gray).



Photos, Dick Smith

Autumn near Peacham

The contributors of this article are Thomas Day Seymour Bassett, Curator of the Wilbur Collection of the Guy W. Bailey Library and University Archivist of the University of Vermont; J. Rowland Illick, Professor of Geography at Middlebury College; and Gordon Mills, Editor of The Burlington Free Press.

Early in the Revolutionary War, Vermont's Green Mountain Boys, led by Ethan Allen, gained fame for their capture of Fort Ticonderoga from the British. But Vermont did not join the newly formed United States after the war. It remained an independent republic until about 10 years after the last battle. Then, on March 4, 1791, Vermont entered the Union as the 14th state. It was the first state admitted to the Union after the 13 original colonies.

During the 1850's, Vermont began a voting record unequaled by any other state. From then until the 1960's, Vermont voters chose only Republicans in elections for President and governor. They also chose Republicans in all elections for the U.S. Senate and House of Representatives between the mid-1800's and the mid-1900's. No state has voted so many times in a row for major candidates of the same party. Two Vermont Republicans, Chester A. Arthur and Calvin Coolidge, became President of the United States.

The word *Vermont* comes from *Vert Mont*, the French words for *Green Mountain*. Vermont's nickname is the *Green Mountain State*. For the relationship of Vermont to other states in its region, see NEW ENGLAND.

FACTS IN BRIEF

Capital: Montpelier.

Government: *Congress*—U.S. senators, 2; U.S. representatives, 1. *Electoral Votes*—3. *State Legislature*—senators, 30; representatives, 150. *Counties*—14.

Area: 9,609 sq. mi. (24,887 km²), including 342 sq. mi. (886 km²) of inland water; 43rd in size among the states. *Greatest Distances*—north-south, 155 mi. (249 km); east-west, 90 mi. (145 km).

Elevation: *Highest*—Mount Mansfield, 4,393 ft. (1,339 m) above sea level. *Lowest*—Lake Champlain in Franklin County, 95 ft. (29 m) above sea level.

Population: *Estimated 1975 Population*—474,000; 48th among the states; distribution, 68 per cent rural, 32 per cent urban; density, 49 persons per sq. mi. (19 persons per km²). *1970 Census*—444,732.

Chief Products: *Agriculture*—apples, beef cattle, dairy products, eggs, forest products, hay, maple sugar and syrup. *Manufacturing*—electrical machinery, nonelectrical machinery, paper and paper products, printed materials. *Mining*—asbestos, sand and gravel, stone, talc.

Statehood: March 4, 1791, the 14th state.

State Motto: *Vermont, Freedom and Unity.*

State Song: "Hail, Vermont!" by Josephine Hovey Perry.

Constitution of Vermont was adopted in 1793. Vermont had two earlier constitutions, adopted in 1777 and 1786. The constitution of 1777 was the most liberal of its time. It gave all adult male citizens the right to vote, without regard to their race or religion, or whether or not they owned property. It also forbade slavery.

Amendments (changes) to the constitution may be proposed every four years by a two-thirds vote of the state Senate. The proposed amendments must be approved by a majority vote in the state House of Representatives. At the next legislative session two years later, the amendments require approval by a majority of both the House and the Senate. Finally, to become law, amendments need the approval of a majority of the people who vote on the proposals in an election.

Executive. The governor of Vermont is elected to a two-year term. He receives a $30,000 yearly salary. He may be re-elected any number of times. Vermont has no official residence for its governor. For a list of all the governors of Vermont, see the *History* section of this article. Vermont voters also elect the lieutenant governor, attorney general, auditor, secretary of state, and treasurer to two-year terms. The governor appoints most other top officials, with senate approval.

Legislature of Vermont is called the *General Assembly*. It consists of a 30-member Senate and a 150-member House of Representatives. The voters in each of Vermont's 13 senatorial districts elect from one to six senators, depending on total population. Voters in each of 106 representative districts and subdistricts elect one or two representatives, depending on voter population. Senators and representatives serve two-year terms. The General Assembly meets in odd-numbered years.

Courts. The Supreme Court, Vermont's highest court, has a chief justice and four associate justices. The legislature elects the Supreme Court justices to two-year terms. It elects Vermont's six Superior Court judges to six-year terms. It usually re-elects the men until their death or retirement. Each county has one or two probate courts, whose judges are elected to two-year terms. The governor, with the legislature's approval, appoints the District Court judges to four-year terms.

Local Government in Vermont is centered in towns. Vermont towns are similar to townships in other states. That is, they are geographic areas that may include several communities and large rural districts under one government. In Vermont, there are 238 towns with local governments. Five towns—Averill, Ferdinand, Glastenbury, Lewis, and Somerset—have too few inhabitants to have governments. They range in population from no persons in Glastenbury, Lewis, and Somerset to 14 persons in Ferdinand. Each of Vermont's eight cities also has a local government.

Vermont towns use the *town meeting* form of government, the purest type of democracy. A town meeting allows citizens to take a direct part in government business. Each March, town voters assemble to elect officials, approve budgets, pass laws, and decide other local business. Vermont cities operate under council-manager or mayor-council governments. The cities must submit changes in their charters to the legislature for approval. The powers of Vermont county governments are limited mainly to judicial affairs.

Stu Perry

The Vermont House of Representatives occupies a chamber, *above*, in the Vermont State House in Montpelier.

Hanson Carroll

A Town Meeting, *right,* enables Vermont citizens to take a direct part in government. All town voters may attend the annual meetings to elect officials and decide other local matters.

The State Seal

Symbols of Vermont. On the state seal, the 14 branches on the pine tree represent the 13 original states and Vermont. The wavy lines at the top symbolize the sky and the wavy lines on the bottom stand for Lake Champlain, which forms part of Vermont's western boundary. The cow and the sheaves of wheat represent dairying and agriculture. The seal was designed and adopted in 1779 and modified in 1937. The state flag, adopted in 1923, carries the Vermont coat of arms. It shows a view of the Green Mountains.

Flag, flower, and bird illustrations, courtesy of Eli Lilly and Company

The State Flag

Taxation provides about 60 per cent of the state government's income. Almost all the rest comes from federal grants and other U.S. government programs. An individual income tax brings in over a fourth of the tax income. Motor fuel taxes and drivers' license and vehicle registration fees also bring in over a fourth of the income. Other taxes, in order of importance, include those on sales, rooms and meals, alcoholic beverages, tobacco products, and corporation net income.

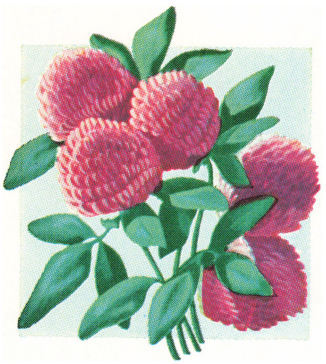
Politics. Vermont has voted for more Republican presidential nominees than any other state. Since 1856, it has given its electoral votes to the Republican nominee in every presidential election except the 1964 race. That year, Vermont supported Democrat Lyndon B. Johnson in his victory over Republican Barry M. Goldwater. For Vermont's voting record in presidential elections, see ELECTORAL COLLEGE (table).

All of Vermont's U.S. representatives between 1853 and 1959, and all of Vermont's governors between 1854 and 1963 were Republicans. In 1974, Patrick J. Leahy became the first Democrat to be elected to the U.S. Senate from Vermont since the early 1800's.

The State Bird
Hermit Thrush

State House, the seat of state government in Vermont, is in Montpelier. Its dome is covered with gold leaf and topped by a statue of Ceres, the Roman goddess of agriculture. Montpelier has been the state capital since 1808. Many towns served as temporary capitals between 1777 and 1808.

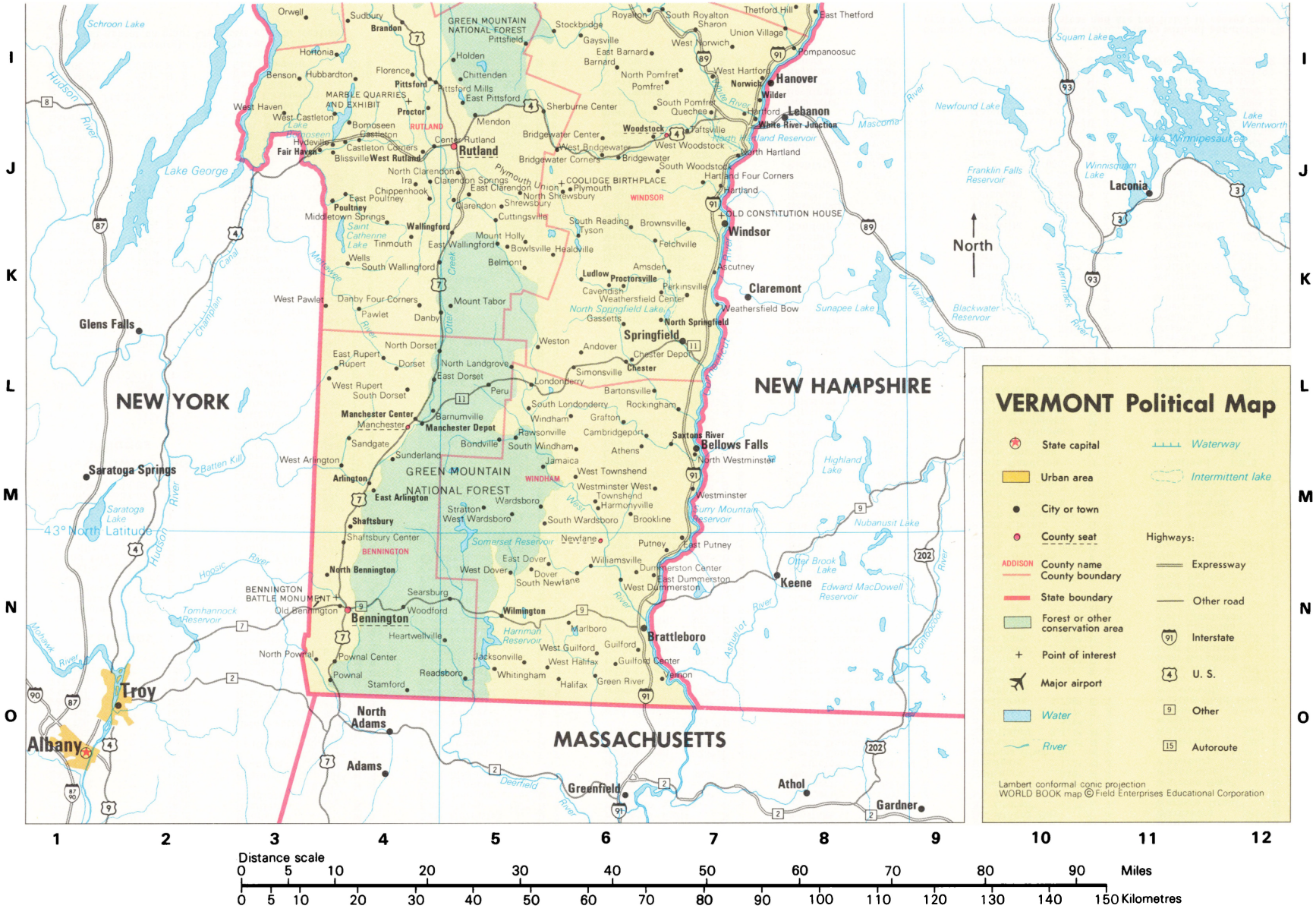
Arthur Griffin



The State Flower
Red Clover

The State Tree
Sugar Maple

QUEBEC
CANADA
UNITED STATES
NEW YORK
NEW HAMPSHIRE
73° West Longitude
72° West Longitude
45° North Latitude
44° North Latitude
Cowansville
Coaticook
Lake Memphremagog
Lake Massawippi
Second Lake
East Connecticut Lake
Lake Francis
Missisquoi River
Wallace Pond
Averill Lake
Alburg
Alburg Springs
East Alburg
Alburg Center
Morses Line
East Franklin
Franklin
Highgate Springs
Highgate Center
Highgate Falls
East Highgate
North Sheldon
Sheldon Junction
Enosburg Center
Sheldon
Enosburg Falls
West Enosburg
Richford
West Berkshire
Berkshire
East Berkshire
Montgomery
Montgomery Center
Bordoville
Fairfield
East Fairfield
Bakersfield
North Fairfax
Swanton
Sheldon Springs
South Alburg
MISSISQUOI NATIONAL WILDLIFE REFUGE
Isle La Motte
North Hero
Saint Albans
Saint Albans Bay
GRAND ISLE
Grand Isle
Georgia Center
Georgia Plains
Grand Isle Station
SOUTH HERO ISLAND
Keeler Bay
South Hero
West Milton
Milton
Checkerberry Village
Westford
Plattsburgh
Chazy Lake
Great Chazy River
Saranac River
Lake Champlain
Colchester
Essex Center
Underhill
Jericho
Underhill Center
Jericho Center
Winooski
Burlington
South Burlington
Essex Junction
Williston
CHITTENDEN
Shelburne
Shelburne Falls
SHELBURNE MUSEUM
Ausable River
East Branch Ausable River
Charlotte
Hinesburg
East Charlotte
South Hinesburg
North Ferrisburg
Monkton Ridge
Monkton
Ferrisburg
Starksburg
Vergennes
Panton
ADDISON
Bristol
New Haven
West Lincoln
Lincoln
New Haven Mills
South Lincoln
Addison
Weybridge
Weybridge Hill
Middlebury
Bouquet River
Otter Creek
Bridport
Cornwall
West Cornwall
West Salisbury
Shoreham
Shoreham Center
Whiting
Salisbury
Leicester
Leicester Junction
Goshen
Forest Dale
Lake Dunmore
Schroon Lake
Ticonderoga
GREEN MOUNTAIN NATIONAL FOREST
Hancock
Granville
East Granville
Rochester
Talcville
Ripton
East Middlebury
Lower Granville
Randolph Center
Randolph
South Randolph
North Tunbridge
Tunbridge
Strafford
South Tunbridge
South Strafford
East Bethel
Bethel
North Thetford
Thetford Center
Moretown
Hanksville
North Fayston
South Duxbury
Waterbury
Waterbury Center
Duxbury
Huntington
Huntington Center
Middlesex
Moretown
Mad River
Waitsfield
Irasville
Northfield Falls
Northfield
Northfield Center
South Northfield
Roxbury
Calais
Worcester
Colbyville
Adamant
Putnamville
North Montpelier
Montpelier
WASHINGTON
Plainfield
East Montpelier
Berlin
Berlin Corners
Barre
South Barre
GRANITE QUARRIES
Websterville
East Barre
Graniteville
Orange
Williamstown
Washington
East Orange
Brookfield
East Brookfield
Brookfield Center
West Corinth
East Braintree
West Braintree
Chelsea
North Randolph
East Randolph
Vershire
ORANGE
Bradford
Cookville
Corinth Center
Bradford Center
Newbury
West Newbury
South Newbury
Waits River
East Corinth
Wells River
Boltonville
East Topsham
West Topsham
Groton
South Ryegate
Ryegate Corner
East Ryegate
Lake Groton
McIndoe Falls
Barnet
West Barnet
South Peacham
Peacham
East Peacham
Lower Waterford
East Barnet
Ewells Mill
Harvey
Passumpsic
Danville
West Danville
Cabot
Lower Cabot
East Calais
Marshfield
South Woodbury
Woodbury
Moscow
Stowe
Lower Village
SMUGGLERS NOTCH
Morrisville
Lake Elmore
Morrisville
Hardwick
East Hardwick
Greensboro Bend
Wolcott
Greensboro
North Wolcott
Caspian Lake
Hyde Park
Cadys Falls
Morrisville
Johnson
East Johnson
Centerville
North Hyde Park
Green River Reservoir
Cambridge
Cambridge Junction
Jeffersonville
North Cambridge
Waterville
Fletcher
Binghamville
Fairfax
Belvidere Corners
Belvidere Center
Eden Mills
Eden
Albany
West Glover
Glover
South Albany
Mill Village
Craftsbury Common
East Craftsbury
Craftsbury
Irasburg
Lowell
Orleans
ORLEANS
Brownington
Brownington Center
Evansville
Westmore
Lake Willoughby
Barton
Sheffield
Wheelock
West Burke
Sutton
Burke Hollow
East Burke
Gallup Mills
Lyndon Center
Lyndonville
East Lyndon
Lyndon
Stannard
Victory
CALEDONIA
North Danville
Walden
East Saint Johnsbury
Saint Johnsbury
Saint Johnsbury Center
North Concord
Concord
East Concord
Gilman
Lunenburg
South Lunenburg
Granby
Guildhall
Maidstone
Maidstone Lake
East Haven
Moose River
Lancaster
Berlin
Upper Ammonoosuc River
Ammonoosuc River
Androscoggin River
Moore Reservoir
Saco River
Connecticut River
Black River
Lamoille River
Winooski River
Passumpsic River
Wallace Pond
Averill Lake
Seymour Lake
Newport
Newport Center
Derby Line
Derby Center
Holland
North Troy
Troy
Westfield
Coventry
Jay
Beebe Plain
West Charleston
Morgan
Morgan Center
East Charleston
Island Pond
Lemington
Bloomfield
Newark
ESSEX
LAMOILLE
FRANKLIN
ORLEANS
CALEDONIA
ESSEX
WASHINGTON
ORANGE
ADDISON
CHITTENDEN
GRAND ISLE


VERMONT Political Map
State capital
Urban area
City or town
County seat
ADDISON County name
County boundary
State boundary
Forest or other conservation area
Point of interest
Major airport
Water
River
Waterway
Intermittent lake
Highways:
Expressway
Other road
Interstate
U. S.
Other
Autoroute
Lambert conformal conic projection
WORLD BOOK map © Field Enterprises Educational Corporation
NEW YORK
NEW HAMPSHIRE
MASSACHUSETTS
GREEN MOUNTAIN NATIONAL FOREST
Rutland
Bennington
Brattleboro
Hanover
Lebanon
Windsor
Claremont
Springfield
Bellows Falls
Keene
Glens Falls
Saratoga Springs
Troy
Albany
North Adams
Adams
Greenfield
Athol
Gardner
Laconia
Lake George
Lake Champlain
Lake Winnipesaukee
Lake Wentworth
Newfound Lake
Sunapee Lake
Squam Lake
Saratoga Lake
Somerset Reservoir
Harriman Reservoir
Tomhannock Reservoir
Surry Mountain Reservoir
North Springfield Lake
Franklin Falls Reservoir
Blackwater Reservoir
Highland Lake
Nubanusit Lake
Otter Brook Lake
Edward MacDowell Reservoir
Hoosic River
Hudson River
Mohawk River
Connecticut River
Batten Kill
Deerfield River
Ashuelot River
Contoocook River
Merrimack River
Mascoma River
Ottauquechee River
Saint Catherine Lake
Lake Bomoseen
43° North Latitude
North
Distance scale
0 5 10 20 30 40 50 60 70 80 90 Miles
0 5 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 Kilometres

VERMONT MAP INDEX

Population

444,732	Census	1970
389,881	"	1960
377,747	"	1950
359,231	"	1940
359,611	"	1930
352,428	"	1920
355,956	"	1910
343,641	"	1900
332,422	"	1890
332,286	"	1880
330,551	"	1870
315,098	"	1860
314,120	"	1850
291,948	"	1840
280,652	"	1830
235,981	"	1820
217,895	"	1810
154,465	"	1800
85,425	"	1790

Counties

Addison ...24,266..F 4
Bennington 29,282..N 4
Caledonia .22,789..E 8
Chittenden .99,131..E 5
Essex .....5,416..C 10
Franklin ...31,282..C 5
Grand Isle ..3,574..C 3
Lamoille ...13,309..D 6
Orange ....17,676..H 7
Orleans ....20,153..C 8
Rutland ...52,637..J 4
Washington 47,659..F 6
Windham ..33,074..M 5
Windsor ...44,082..J 6

Cities, Towns, and Villages

Adamant .....E 7
Addison .....717[A].G 3
Albany 175
(528[A])..C 7
Alburg 520
(1,271[A])..B 3
Alburg Springs .....B 4
Amsden .....K 7
Andover .....239[A].L 6
Arlington ..1,212
(1,934[A])..M 4
Ascutney .....K 7
Athens .....159[A].M 6
Averill .....8[A].B 10
Averys Gore* .....B 10
Bakersfield ...635[A].C 5
Baltimore* ...170[A].K 6
Barnard .....569[A].I 6
Barnet .....1,342[A].F 9
Barnumville .....L 4
Barre* .....6,509[A].F 7
Barre .....10,209..F 7
Barton 1,051
(2,874[A])..C 8
Bartonsville .....L 6
Beebe Plain .....B 8
Beecher Falls .....B 11
Bellows
Falls .....3,505..M 7
Belmont .....K 5
Belvidere* .....189[A].C 6
Bennington .7,950
(14,586[A]).°N 4
Benson* .....583[A].I 3
Berkshire .....931[A].B 6
Berlin .....2,050[A].F 6
Bethel .....1,347[A].I 6
Blissville .....J 4
Bloomfield ...196[A].C 10
Bolton .....427[A].E 5
Bomoseen .....J 4
Bondville .....M 5
Bowlsville .....K 5
Bradford 709
(1,627[A])..H 8
Braintree* ....751[A].H 6
Brandon 1,720
(3,697[A])..I 4
Brattleboro .9,055
(12,239[A])..N 6
Bridgewater ...783[A].J 6
Bridport .....809[A].H 3
Brighton* ...1,365[A].C 9
Bristol 1,737
(2,744[A])..G 4
Brookfield .....606[A].G 6
Brookline .....180[A].M 6
Brownington ..522[A].C 8
Brownsville .....K 7
Brunswick* ....45[A].C 9
Buel's Gore* ..10..F 5
Burke* .....1,053[A].D 9
Burke Hollow .....D 9
Burlington .38,633.°E 4
Cabot 253
(663[A])..E 7
Cadys Falls .....D 6
Calais* .....749[A].E 6
Cambridge 235
(1,528[A])..D 5
Cambridgeport .....M 6
Canaan .....949[A].B 11
Castleton ....2,837[A].J 4
Cavendish ...1,264[A].K 6
Centerville .....D 6
Charleston* ...654[A].B 9
Charlotte ....1,802[A].F 4
Chelsea .....983°H 7
Chester .....2,371[A].L 6
Chippenhook .....J 4
Chittenden ....646[A].I 5
Clarendon ...1,537[A].J 5
Clarendon
Springs .....J 4
Colbyville .....E 6
Colchester ...8,776[A].D 4
Concord 353
(896[A])..F 5
Cookville .....G 8
Corinth* .....683[A].G 8
Corinth Center .....G 8
Cornwall .....900[A].H 4
Coventry .....492[A].C 8
Craftsbury ....632[A].D 7
Cuttingsville .....K 5
Danby .....910[A].K 5
Danby Four
Corners .....K 4
Danville ....1,405[A].E 8
Derby* .....3,252[A].B 8
Derby Center .547..B 8
Derby Line ..834..B 8
Dorset .....1,293[A].L 4
Dover .....555[A].N 5
Dum-
merston* ..1,295[A].N 6
Duxbury .....621[A].F 6
East Barnard .....I 6
East Barre .....G 7
East Burke .....D 9
East Calais .....E 7
East Charleston .....C 9
East Charlotte .....F 4
East Concord .....E 10
East Corinth .....G 8
East Dorset .....L 4
East Dover .....N 6
East Dummerston ..N 6
East Franklin .....B 5
East Granville .....G 6
East Hardwick ....D 7
East Haven ...197[A].D 9
East Johnson .....D 6
East Lyndon .....D 9
East Middlebury ...H 4
East
Montpelier 1,597[A].F 7
East Orange .....G 7
East Peacham .....F 8
East Poultney .....J 4
East Putney .....M 7
East Randolph .....H 6
East Richford .....B 6
East Rupert .....L 4
East Ryegate .....F 8
East St.
Johnsbury .....E 9
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[A]Entire town (township), including rural area
*Does not appear on map; key shows general location.
°County seat

Source: Latest census figues (1970). Places without population figures are unincorporated areas and are not listed in census reports.

VERMONT / People

The 1970 United States census reported that Vermont had 444,732 persons. The population had increased 14 per cent over the 1960 census figure, 389,881. The U.S. Bureau of the Census estimated that by 1975 the state's population had reached about 474,000.

Fewer persons live in Vermont than in any other state east of the Mississippi River. West of the Mississippi, only Alaska and Wyoming have fewer people.

Almost 70 per cent of Vermont's people live in rural areas—a greater percentage than in any other state. Vermont is the only New England state with a larger rural than urban population.

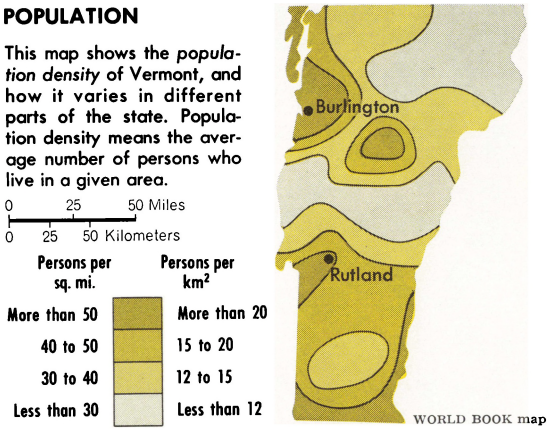
Burlington is Vermont's largest city. It has twice as many people as Rutland, the second largest city. Vermont's other cities, in order of size, are Barre, Montpelier, St. Albans, Winooski, Newport, and Vergennes. Bennington and Brattleboro have the largest populations among Vermont's 243 towns. See the separate articles on Vermont cities, towns, and villages listed in the *Related Articles* at the end of this article.

About 96 of every 100 Vermonters were born in the United States. More than half the people born in other countries came from Canada. The largest religious groups, in order of size, include Roman Catholics, members of the United Church of Christ, Methodists, Baptists, and Episcopalians.

Like other New Englanders, the people of Vermont have long been called *Yankees*. This word is used to mean such traits as thrift, conservative manners, reserved speech, and respect for individual rights.

POPULATION

This map shows the *population density* of Vermont, and how it varies in different parts of the state. Population density means the average number of persons who live in a given area.



VERMONT / Education

Schools. The town of Guilford voted funds for a free public school in 1761. Vermont's constitution of 1777 required each town to have a public school. In 1780, Bennington established the state's first secondary school. Vermont's first statewide school fund was approved by the legislature in 1825. Samuel Read Hall, a pioneer educator, established the first U.S. teacher-training school at Concord in 1823.

A state commissioner of education and a seven-member board of education supervise Vermont's public-school system. The governor, with the senate's approval, appoints the board members to six-year terms. The board members, with the governor's approval, appoint the commissioner for an indefinite term.

Vermont's city and town school districts are administered by local boards of directors. The largest local districts also have a superintendent of schools. The smaller districts are grouped into *supervisory unions*, each headed by a superintendent. These unions work with the local boards of directors in managing school affairs.

Vermont law requires children between the ages of 7 and 16 to attend school. For the number of students and teachers in Vermont, see EDUCATION (table).

Libraries. Vermont's first library opened in Brookfield in 1791. It is one of the oldest libraries still operating in the United States. Today, Vermont has more than 200 public libraries. The Department of Libraries in Montpelier specializes in legal reference works, and has the state's best collection of early Vermont newspapers. The Bailey Library of the University of Vermont is the state's largest.

Museums. The Vermont Historical Society Museum in Montpelier features Vermont town histories, old coins, manuscripts, tools, and weapons. The museum owns one of the oldest globes made in the United States. The globe was made by James Wilson during the early 1800's. The museum also houses the first printing press used in the United States. This press was set up by Stephen Daye in Cambridge, Mass., in 1639. The Bennington Museum has early American glassware, pottery, Vermont art, and historic flags. The University of Vermont's Robert Hull Fleming Museum in Burlington displays art from many periods. The Saint Johnsbury Athenaeum has fine paintings. The Sheldon Museum in Middlebury houses early Vermont documents, household furnishings, portraits, and tools. The Daniels Museum in Orwell has many items used by Indians. The Shelburne Museum is described in the *Places to Visit* section of this article.

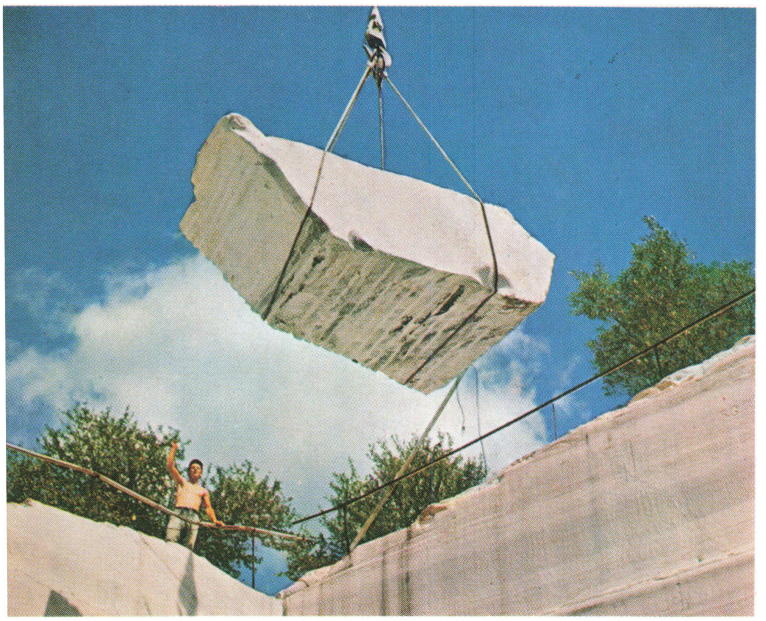
UNIVERSITIES AND COLLEGES

Vermont has 14 universities and colleges accredited by the New England Association of Colleges and Secondary Schools. For enrollments and further information, see UNIVERSITIES AND COLLEGES (table).

Name	Location	Founded
Bennington College	Bennington	1932
Castleton State College	Castleton	1867
Goddard College	Plainfield	1938
Johnson State College	Johnson	1828
Lyndon State College	Lyndonville	1944
Marlboro College	Marlboro	1947
Middlebury College	Middlebury	1800
Norwich University	Northfield	1819
St. Joseph the Provider, College of	Rutland	1954
St. Michael's College	Winooski	1904
School for International Training	Brattleboro	1964
Trinity College	Burlington	1925
Vermont, University of	Burlington	1791
Windham College	Putney	1960

Arthur Griffin

Side-Wheeler *S.S. Ticonderoga* in Shelburne Museum



Arthur Griffin

Marble Quarry in Proctor

Hanson Carroll

Fishing on the West River

VERMONT/*A Visitor's Guide*

Vermont's mountains, lakes, and streams offer a variety of recreational activities. Visitors to the Green Mountains can hike on the Long Trail. This footpath in the wilderness winds through the mountains from Massachusetts to Canada. Overnight camps lie along the trail every six to eight miles. In winter, tourists flock to 40 ski resorts in the Green Mountains and other ranges. The largest ski resorts are near Manchester, Rutland, Stowe, Waitsfield, and Wilmington. The skiing season usually lasts from mid-December to mid-April. Visitors also enjoy summer boating on Vermont's larger lakes and fishing in the state's many streams.

Many vacationers go to Vermont just for the beautiful scenery. In the fall, much of the state is ablaze with the orange, purple, red, and yellow colors of turning leaves. Vermont's quiet towns and villages are other favorite scenes. They are noted for their white churches.

PLACES TO VISIT

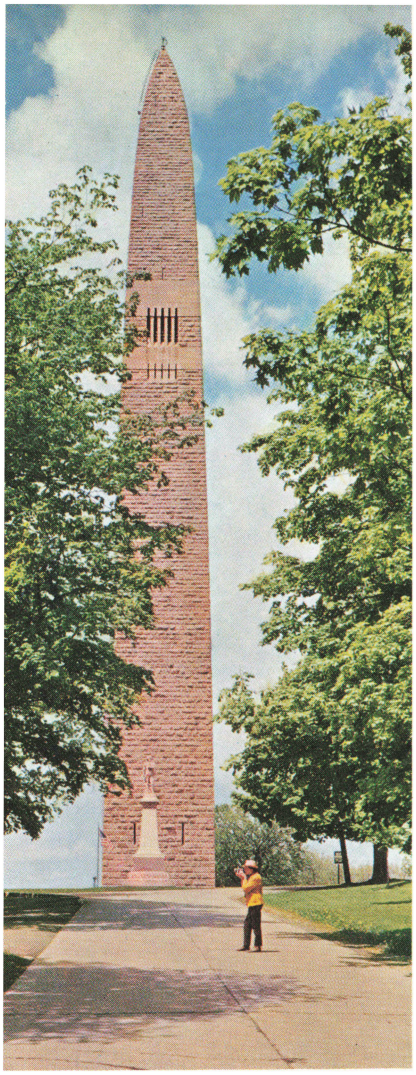
Following are brief descriptions of some of Vermont's many interesting places to visit.

Bennington Battle Monument, in Bennington, is a granite tower 306 feet (93 meters) high. It honors the colonists who defeated the British in the Battle of Bennington in 1777. The tower is the world's second highest battle monument. Only the 570-foot (174-meter) San Jacinto Battle Monument near Houston, Tex., is higher.

Coolidge Birthplace, in Plymouth Notch, is now a combination store and post office. A nearby museum houses possessions of President Calvin Coolidge. A simple gravestone marks his grave in the town cemetery.

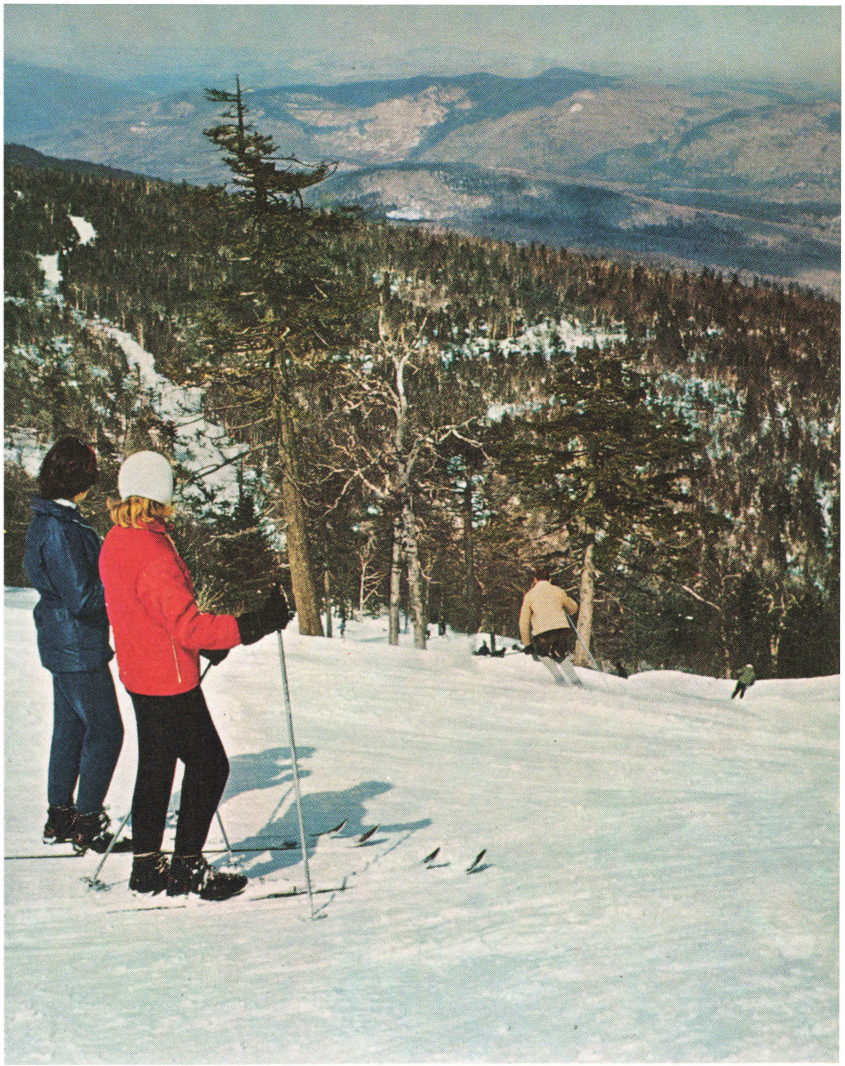
Granite Quarries cut deeply into Millstone Hill in Barre. Visitors can watch large granite blocks being quarried, and see granite being sawed, polished, and carved in the world's largest stone-finishing plant.

Marble Quarries and Marble Exhibit are Proctor's chief attractions. The quarries are among the world's largest. The exhibit, in the display rooms of the Vermont Marble Company, features the world's largest collection of various kinds of marble.



Arthur Griffin

Bennington Battle Monument



Robert H. Perry

Skiing on Killington Peak near Rutland

Old Constitution House, in Windsor, is the building in which Vermont's first constitution was written. This two-story frame house, which was originally a tavern, was built in 1772.

Shelburne Museum, in Shelburne, is a reconstruction of an early American village. The museum includes more than 30 historic buildings with such items as carriages, china, dolls, furniture, glass, paintings, pewter, rugs, textiles, and toys. The side-wheeler steamship *Ticonderoga*, which once sailed Lake Champlain, is part of the museum.

Smuggler's Notch, near Stowe, is a wide gap between Mount Mansfield and the Sterling Mountains. The notch got its name during the War of 1812, when smugglers brought goods through the notch from Canada to Boston.

National Forest. Green Mountain National Forest, established in 1911, is located in southern and central Vermont. For the forest's chief features, see NATIONAL FOREST (table).

State Parks and Forests. Vermont has 45 state parks and 34 state forests. For information on them, write to Commissioner of Forests and Parks, State Office Building, State Street, Montpelier, Vt. 05602.

ANNUAL EVENTS

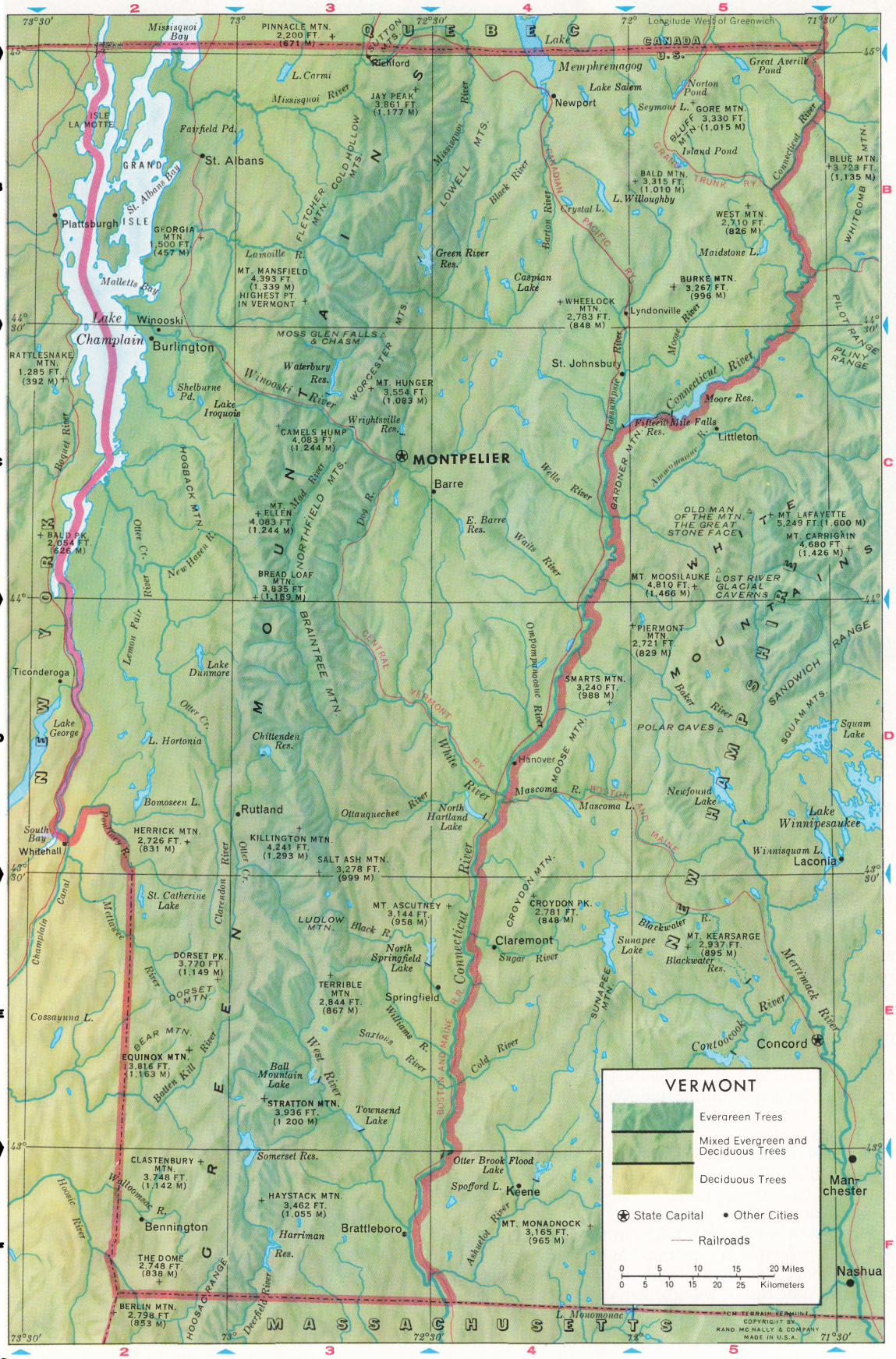
Skiing contests rank among Vermont's most popular annual events. Ski jumping and racing contests take place in many parts of the state throughout the winter months.

Vermont's maple-sugar season begins when the winter snows start melting, usually in March. Many people gather at maple-sugar houses to watch maple syrup being made from maple sap. October is the best month to see the brilliant colors of Vermont's autumn leaves.

Other annual events in Vermont include the following.

March-July: Town Meeting Day, statewide (first Tuesday in March); Franklin County Maple Festival in St. Albans (April); Vermont Dairy Festival in Enosburg Falls (June); Cracker Barrel Bazaar in Newbury (July); Old-Time Fiddlers Contest in Craftsbury Common (July).

August-November: Antique Car Rally in Stowe (August); Fairs in Barton, Bradford, Essex Junction, Lyndonville, Rutland, and Tunbridge (late July to September); Foliage Festivals, statewide (mid-September through mid-October).


VERMONT
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Mixed Evergreen and Deciduous Trees
Deciduous Trees
State Capital
Other Cities
Railroads
0 5 10 15 20 Miles
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Longitude West of Greenwich
CANADA
U.S.
QUEBEC
MASSACHUSETTS
Lake Champlain
Lake Memphremagog
Lake Winnipesaukee
Burlington
Winooski
Plattsburgh
St. Albans
Newport
Richford
Rutland
Montpelier
Barre
Lyndonville
St. Johnsburg
Littleton
Hanover
Claremont
Springfield
Keene
Brattleboro
Bennington
Concord
Manchester
Nashua
Laconia
Ticonderoga
Whitehall
Mascoma
Mascoma L.
Lake Salem
Lake Iroquois
Lake Dunmore
Lake George
Lake Champlain
Green River Res.
Caspian Lake
Crystal L.
L. Willoughby
Maidstone L.
Moore Res.
Waterbury Res.
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North Hartland Lake
Newfound Lake
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Sunapee Lake
Blackwater Res.
Contoocook
Cossayuna L.
L. Hortonia
Chittenden Res.
Bomoseen L.
St. Catherine Lake
Mallett Bay
St. Albans Bay
Missisquoi Bay
Isle La Motte
Grand Isle
Fairfield Pd.
L. Carmi
Norton Pond
Seymour L.
Island Pond
Great Averill Pond
Maquam Bay
Shelburne Pd.
Lake Iroquois
Lake Dunmore
Lake Hortonia
Lake Winnipesaukee
Lake Memphremagog
Lake Salem
Lake Champlain
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Lake Dunmore
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Lake Champlain

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Moose R. .....C 5
Moss Glen Falls and Chasm .....C 3
Mt. Ascutney .....E 3
Mt. Ellen .....C 3
Mt. Hunger .....C 3
Mt. Mansfield (Highest Point In Vermont) .....B 3
New Haven R. .....C 2
North Hartland Lake D 4
North Springfield Lake .....E 3
Northfield Mts. .....C 3
Norton Pond .....B 5
Ompompanoosuc R. .D 4
Ottauquechee R. ....D 3
Otter Creek .....C 2
Passumpsic R. .....C 4
Poultney R. .....D 2
St. Albans Bay.....B 2
Salt Ash Mountain ..D 3
Saxtons R. .....E 3
Seymour Lake .....B 5
Shelburne Pond ....C 2
Somerset Reservoir...F 3
Stratton Mountain ..E 3
Terrible Mountain ...E 3
Townshend Lake ....E 3
Waits R. .....C 4
Walloomsac R. .....F 2
Waterbury Res. .....C 3
Wells R. .....C 4
West Mountain .....B 5
West R. .....E 3
Wheelock Mountain .B 4
White R. .....D 4
Williams R. .....E 3
Winooski R. .....C 3
Worcester Mts. .....C 3
Wrightsville Res. ...C 3

VERMONT / *The Land*

Land Regions. Vermont has six main land regions: (1) the White Mountains, (2) the Western New England Upland, (3) the Green Mountains, (4) the Vermont Valley, (5) the Taconic Mountains, and (6) the Champlain Valley.

The White Mountains region covers the northeastern corner of Vermont and parts of New Hampshire and Maine. In Vermont, the region includes a series of *monadnocks*. A monadnock is a mountain of rock that did not wear down when erosion leveled the land around it. The monadnocks have rounded slopes and rise 2,700 to 3,300 feet (823 to 1,010 meters) above sea level. The highest are Gore Mountain (3,330 feet, or 1,015 meters), Burke Mountain (3,267 feet, or 996 meters), and Mount Monadnock (3,140 feet, or 957 meters). Swift streams cut between the monadnocks and flow into the Connecticut and other rivers.

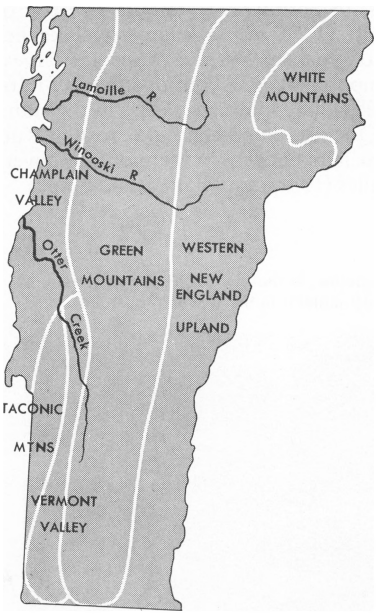
The Western New England Upland covers most of eastern Vermont. It also extends into Massachusetts and Connecticut. This region is sometimes called the *Vermont Piedmont*. In the east, it consists of the broad, fertile lowlands of the Connecticut River Valley. Farmers in the valley raise dairy cattle and grow apples and strawberries. The lowlands rise gradually to hills in the west. The Granite Hills, near Barre, include 1,700-foot (518-meter) Millstone Hill. Many lakes lie among hills in the northern part of the region.

The Green Mountains region covers central Vermont. The famous Green Mountains make up all but the northeastern corner of the region. In the northeast, the Green Mountains taper off into the Northfield, Worcester, and several other low mountain ranges.

Mount Mansfield, one of the Green Mountains, is the highest peak in Vermont. It rises 4,393 feet (1,339 meters) above sea level. Killington Mountain (4,241 feet, or 1,293 meters), Mount Ellen (4,083 feet, or 1,244 meters), and Camels Hump (4,083 feet, or 1,244 meters)—all in the Green Mountains—are Vermont's next tallest peaks. The Green Mountains region is the center of Vermont's tourist industry, and an important source of minerals.

The Vermont Valley is a narrow region that stretches about halfway up western Vermont from the Massachusetts border. The region includes the valleys of several small rivers, including the Batten Kill and the Walloomsac.

The Taconic Mountains region covers a narrow strip in southwestern Vermont. The region also extends into Massachusetts. In Vermont, it includes many mountains. The highest ones are Equinox Mountain (3,816 feet, or 1,163 meters), Dorset Peak (3,770 feet, or 1,149 meters), Little Equinox Mountain (3,320 feet, or 1,012 meters), Mother Myrick Mountain (3,290 feet, or 1,003 meters), and Bear Mountain (3,260 feet, or 994 meters). Swift streams cut through the mountains, and the mountains surround many scenic lakes.



Land Regions of Vermont

The Champlain Valley, also called the *Vermont Lowland*, borders Lake Champlain. This region includes Burlington, the state's largest city; and some of Vermont's best farmland. The valley has many dairy farms and apple orchards. Farmers in the region also raise corn, hay, oats, and wheat on rolling hills and broad fertile lowlands. Lake Champlain has a series of islands, including Grand Isle and Isle La Motte. These islands are part of Vermont.

Rivers and Lakes. The Connecticut River forms Vermont's entire eastern border. In 1937, a ruling by the Supreme Court of the United States gave control of the river to New Hampshire. Its western border is the low water mark on the Vermont side of the river. Otter Creek is the longest river within Vermont. It rises near East Dorset, flows 90 miles (140 kilometers) north, and empties into Lake Champlain. The Batten Kill River also rises near East Dorset. It flows south into New York. Most other Vermont rivers run down the slopes of the Green Mountains. Some flow down the eastern

slopes and empty into the Connecticut River. Others wind down the western slopes and empty into Lake Champlain. Three large rivers—the Missisquoi, the Lamoille, and the Winooski—rise east of the Green Mountains and pass through them. The rivers empty into Lake Champlain.

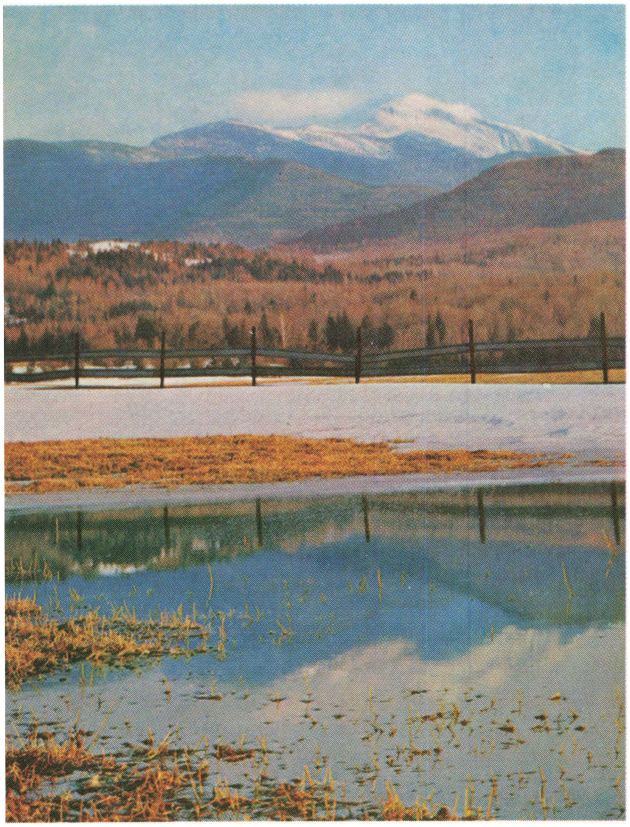
Vermont has about 430 lakes and ponds. Most of them are in the northeast. Lake Champlain, the largest lake in New England, covers 268 square miles (694 square kilometers) in northwest Vermont. The rest of the 490-square-mile (1,270-square-kilometer) lake lies in New York and Quebec. Vermont's second largest lake is Lake Memphremagog. About one third of it, or 10 square miles (26 square kilometers), lies in the state, and the rest is in Quebec. Bomoseen Lake, west of Rutland, is the largest lake entirely in Vermont. It covers about 4 square miles (10 square kilometers).

Dick Smith

A Farm Field adds a golden tint to the countryside surrounding Waterbury Center in Vermont's Green Mountains. The scenic Green Mountains region, which covers central Vermont, attracts many tourists to the state.

Mount Mansfield, *below,* is the highest peak in Vermont. It rises 4,393 feet (1,339 meters) in the Green Mountains.

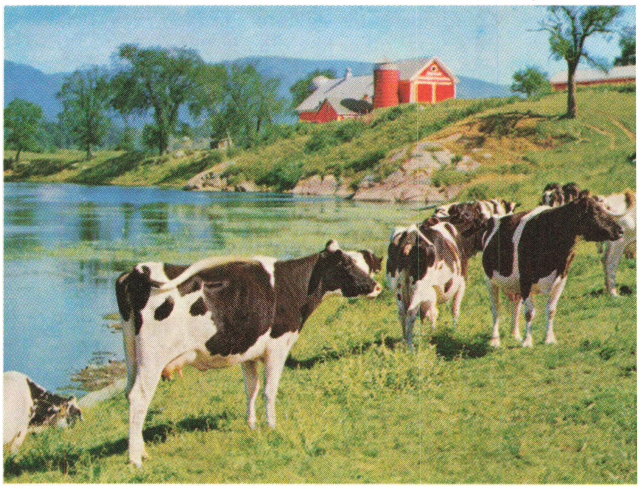
Grant Heilman



Pleasure Boats ride at anchor on the calm waters of Lake Champlain near South Hero. The lake is the largest in New England.

Hanson Carroll

Arthur Griffin



Dairy Cattle Graze along the Connecticut River, *right.* The river forms Vermont's eastern boundary.

VERMONT / *Climate*

Summers in Vermont are short, with few hot days. Summer nights are cool and crisp, especially in the mountains. Vermont has an average July temperature of 68° F. (20° C). Vernon had the state's highest temperature, 105° F. (41° C), on July 4, 1911.

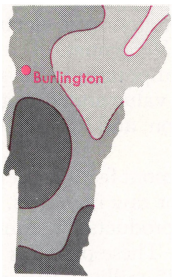
Vermont winters are long and cold, with an average January temperature of 19° F. (−7° C). Bloomfield had the record low temperature, −50° F. (−46° C), on Dec. 30, 1933. Snowfall in the Connecticut River Valley and the Champlain Valley ranges from 60 to 80 inches (150 to 200 centimeters) yearly. The mountains receive from 80 to 120 inches (200 to 305 centimeters) a year. Snow is important to Vermont's economy. The deep snows on mountains attract thousands of skiers. Yearly *precipitation* (rain, melted snow, and other forms of moisture) averages about 40 inches (100 centimeters).

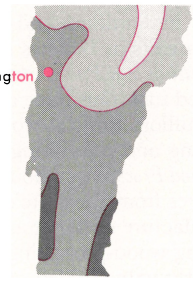
John H. Harris

The West River winds through the snowy hills in southern Vermont. Snowfall is heavy throughout the state.

SEASONAL TEMPERATURES

January





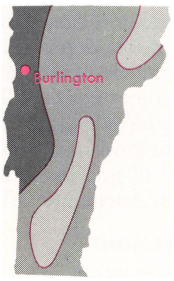
AVERAGE OF DAILY LOW TEMPERATURES

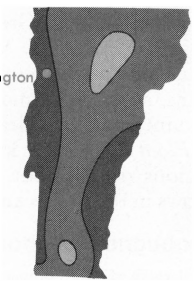
Degrees Celsius	Degrees Fahrenheit
-12 to -10	10 to 14
-14 to -12	6 to 10
-17 to -14	2 to 6
-19 to -17	-2 to 2

AVERAGE OF DAILY HIGH TEMPERATURES

Degrees Fahrenheit	Degrees Celsius
32 to 36	0 to 2
28 to 32	-2 to 0
24 to 28	-4 to -2
20 to 24	-7 to -4

July





AVERAGE OF DAILY LOW TEMPERATURES

Degrees Celsius	Degrees Fahrenheit
14 to 17	58 to 62
12 to 14	54 to 58
10 to 12	50 to 54

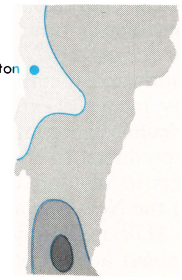
AVERAGE OF DAILY HIGH TEMPERATURES

Degrees Fahrenheit	Degrees Celsius
82 to 86	28 to 30
78 to 82	26 to 28
74 to 78	23 to 26

AVERAGE YEARLY PRECIPITATION

(Rain, Melted Snow, and Other Moisture)

Centimeters	Inches
132 to 152	52 to 60
112 to 132	44 to 52
91 to 112	36 to 44
71 to 91	28 to 36



0 25 50 75 100 Miles

0 50 100 Kilometers

WORLD BOOK maps

AVERAGE MONTHLY WEATHER

BURLINGTON

	Temperatures F° High	Temperatures F° Low	Temperatures C° High	Temperatures C° Low	Days of Rain or Snow
JAN.	28	8	-2	-13	13
FEB.	28	8	-2	-13	12
MAR.	39	20	4	-7	13
APR.	53	32	12	0	13
MAY	67	43	19	6	13
JUNE	78	54	26	12	12
JULY	82	58	28	14	12
AUG.	80	56	27	13	11
SEPT.	71	48	22	9	12
OCT.	59	38	15	3	11
NOV.	44	28	7	-2	13
DEC.	31	15	-1	-9	13

Manufacturing is Vermont's most important economic activity. The tourist industry ranks second, followed by agriculture and mining. The Burlington area and Windsor County are Vermont's chief manufacturing regions. The tourist industry, centered in the Green Mountains, adds over $250 million a year to the economy. Farms and mines are in many parts of the state.

Natural Resources of Vermont include valuable mineral deposits, thick forests, abundant wildlife, and some fertile soil.

Soil. Vermont's most fertile areas are its river valleys, where flooding streams have deposited rich soils. Many parts of the state are rocky, and have only a thin covering of soil or none at all.

Forests cover about three-fourths of Vermont. The state's hardwood trees include, in order of value, maples, birches, beeches, ashes, poplars, and basswoods. Softwood trees, also in order of value, include spruces, red and white pines, hemlocks, and cedars.

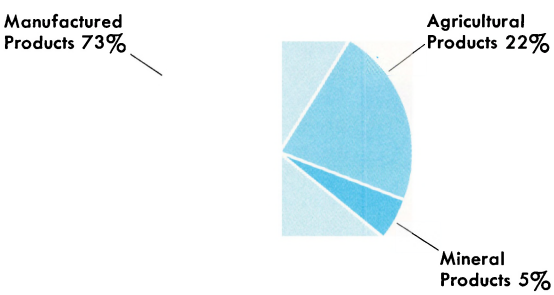
Minerals. Large asbestos, granite, marble, and talc deposits make the Green Mountains region Vermont's chief mineral area. Valuable marble deposits are also found in the Vermont Valley and the Taconic Mountains. Most of Vermont's slate comes from the Taconic Mountains. The Granite Hills have granite deposits.

Plant Life. Many kinds of ferns grow in the mountain regions of Vermont. A variety of grasses and sedges grows in the forests and lowlands. Anemones, arbutuses, buttercups, daisies, gentians, goldenrods, lilacs, pussy willows, and violets grow throughout the state.

Animal Life. The white-tailed deer is Vermont's most common game animal. Fur-bearing animals found in the state include bears, beavers, bobcats, foxes, minks, muskrats, raccoons, and skunks. Porcupines, rabbits, squirrels, and woodchucks live in the forests.

PRODUCTION OF GOODS IN VERMONT

Total value of goods produced in 1971—$769,584,000



Percentages are based on farm income, value added by manufacture, and value of mineral production.
Sources: U.S. government publications, 1971-1973.

EMPLOYMENT IN VERMONT

Total number of persons employed in 1972—167,600

	Number of Employees
Manufacturing	38,400
Wholesale & Retail Trade	31,200
Community, Business, & Personal Services	30,300
Government	28,000
Agriculture	15,000
Construction	9,400
Transportation & Public Utilities	8,200
Finance, Insurance, & Real Estate	6,200
Mining	900

Sources: *Employment & Earnings*, May, 1973, U.S. Bureau of Labor Statistics; U.S. Bureau of Employment Security.

Manufacturing accounts for about three-fourths of the value of goods produced in Vermont. Goods manufactured there have a *value added by manufacture* of about $562 million yearly. This figure represents the value created in products by Vermont industries, not counting such costs as materials, supplies, and fuel.

Machinery. The manufacture of machinery is Vermont's leading industrial activity. Electrical equipment has a value added of about $150 million annually. Nonelectrical machinery ranks second and earns about $70 million yearly. Machine tools, such as drills, grinders, and lathes, come chiefly from Springfield and Windsor. Burlington produces computer equipment. Scales are made in Rutland and St. Johnsbury, and electronic instruments in Bellows Falls and Vergennes.

Printing and Publishing are also important in the state. Printed materials have an annual value added of about $55 million. Brattleboro, Burlington, and Rutland have printing and publishing plants.

Wood Processing. About 200 Vermont factories depend on trees from the state's forests for raw materials. The manufacture of paper and paper products is Vermont's leading wood-processing industry. These products have a yearly value added of about $45 million. Paper and paper products are made throughout the state. Vermont's wood-processing industry also includes production of baskets, boxes, building supplies, door and window frames, furniture, lumber, and toys.

Food Processing has a value added of about $42 million yearly. Many Vermont cities and towns have factories that process food. The state's processed foods include beverages, candy, canned and frozen foods, dairy products, and meat products.

Stone Products. Factories in many parts of Vermont make building stone, and markers, memorials, and tombs from granite. Granite polishing is another important Vermont activity. Barre is the center of the state's granite industry. The manufacture of marble products, including memorials and tile, is also important. Proctor and Rutland are the state's chief marble centers. Other stone products include cement blocks, chimney blocks, concrete, and slate.

Other Industries in Vermont produce chemicals, clothing, fabricated metal products, leather products, and primary metals. Textile mill products are also made.

Agriculture accounts for about a fifth of the value of goods produced in Vermont. This percentage of farm products in relation to total products is the highest among the New England states. Vermont farmers earn about $170 million yearly. The state's 6,900 farms cover about a third of Vermont's land area. Vermont farms average 279 acres (113 hectares) in size. Much of the farmland is covered by trees.

Milk accounts for about three-fourths of Vermont's farm income. Vermont has almost as many cattle as

people. The cattle produce about 236 million gallons (893,357,232 liters) of milk yearly. Most of the milk is used to make cheese, nonfat dry milk powder, and other dairy products.

The sale of meat animals, especially calves, earns almost 10 per cent of Vermont's farm income. Poultry and egg sales bring in another 2 per cent.

Crops account for about 10 per cent of the state's farm income. Potatoes rank as the leading vegetable, and apples as the leading fruit. Hay, oats, and corn grown in Vermont are used as animal feed.

Vermont is one of the leading states in producing maple sugar and maple syrup. About 300,000 gallons (1.1 million liters) of maple syrup yearly come from the state's maple trees. Some syrup is made into sugar.

Mining in Vermont accounts for about $36 million yearly. This figure represents about 5 per cent of the value of Vermont products. This percentage is the highest among the New England states. Vermont is among the leading states in the production of asbestos, granite, marble, and slate. The largest U.S. granite quarries are near Barre. White marble is mined at Danby and West Rutland. Red and green marble occur in a few deposits. Fair Haven is Vermont's slate-mining center. The country's largest asbestos mine is near Eden. Sand and gravel are mined in nearly every Vermont county. Limestone is mined in Chittenden, Franklin, and Rutland counties. Talc comes from Lamoille, Windham, and Windsor counties.

Electric Power. Hydroelectric dams on many Vermont rivers provide power for the state's industries. The four largest power dams are on the Connecticut River between Vermont and New Hampshire. They are the Comerford Dam near Barnet, the Samuel C. Moore Dam near Passumpsic, the Vernon Dam near Vernon, and the Wilder Dam near Wilder. Vermont and New Hampshire share the power generated by these dams. Vermont also gets electric power from two sources in New York—the St. Lawrence Power Project and the Niagara Power Project—by overland lines and by underwater cable through Lake Champlain. The Vermont Yankee Nuclear Power Plant in Vernon began operating in 1972.

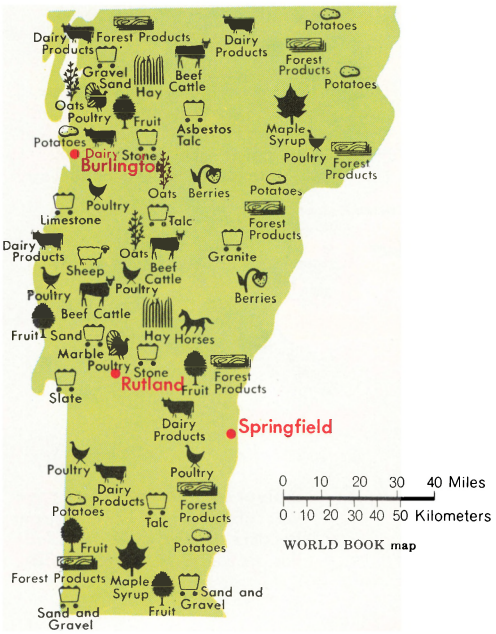
Transportation. Vermont has about 14,000 miles (22,500 kilometers) of roads and highways, most of which are surfaced. Interstate 89 and Interstate 91 are the chief highways. Interstate 89 extends northwest from White River Junction to the Canadian border at Highgate. Interstate 91, scheduled for completion in the late 1970's, will run north and south from Guilford to Derby Line. Airlines serve Burlington, Montpelier-Barre, Rutland, and White River Junction. Railroads operate on about 800 miles (1,300 kilometers) of track in Vermont. About 15 rail lines provide freight service. Passenger trains also serve the state.

Communication. Ten daily newspapers and about 20 weekly newspapers are published in Vermont. *The Vermont Gazette* was published in Westminster for a brief period, beginning in 1780. *The Rutland Herald* is Vermont's oldest continuously published newspaper. It was begun as a weekly in 1794, and is now a daily. The *Burlington Free Press* and the *Times-Argus* of Montpelier-Barre are the state's largest dailies.

Vermont's first radio station, WSYB, opened in Rutland in 1930. The first television station, WCAX-TV, began broadcasting from Burlington in 1954. Vermont now has 22 radio stations and 6 television stations.

FARM, MINERAL, AND FOREST PRODUCTS

This map shows where the state's leading farm, mineral, and forest products are produced. The urban areas (shown on the map in red) are the state's important manufacturing centers.



Factories in Proctor make memorials, tile, and other products from marble. The manufacture of stone products is one of Vermont's leading industries. Factories throughout Vermont use granite, building stone, and marble from the state's quarries.

Carlos H. Elmer

HISTORIC VERMONT

Confederate Soldiers robbed banks in St. Albans in 1864, and fled into Canada. This was the northernmost action of the Civil War.

St. Albans

Fairfield

Gathering Maple Sap became important in Vermont during the late 1700's. The state is famous for sugar and syrup made from maple sap.

Samuel de Champlain, probably the first white man to reach Vermont, claimed the eastern shores of Lake Champlain for France in 1609.

MONTPELIER

Universal Manhood Suffrage was granted in 1777. Vermont became the first state to include this provision in its constitution.

Vermont Joined the Union in 1791. It was the first territory after the original 13 colonies to become part of the United States.

The Green Mountain Boys, led by Ethan Allen, captured Fort Ticonderoga from the British in 1775.

Plymouth Notch

Fort Dummer became Vermont's first permanent white settlement in 1724. Colonists built it to warn villages in western Massachusetts of Indian attacks.

Chester A. Arthur
born in Fairfield

Calvin Coolidge
born in Plymouth Notch

Indian Days. Vermont was chiefly an Indian hunting ground before the white man came. The Abnaki, Mahican, and Penacook tribes of the Algonkian Indian family first claimed the region. Powerful New York Iroquois Indians drove the Algonkian out. The Algonkian returned during the early 1600's. With help from the French, they defeated the Iroquois.

Exploration and Settlement. Samuel de Champlain of France was probably the first white man to explore what is now Vermont. He arrived at Lake Champlain in 1609, and claimed the Vermont region for France. In 1666, the French built a fort dedicated to Saint Anne on Isle La Motte in Lake Champlain. In 1690, Jacobus de Warm led British soldiers from Albany, N.Y., to a point near the site of present-day Middlebury, Vt. De Warm founded a fort at Chimney Point, west of Middlebury. Vermont's first permanent white settlement was made at Fort Dummer, in what is now Brattleboro. Fort Dummer was built by Massachusetts settlers in 1724 to protect that colony's western settlements from raids by the French and Indians.

The Lake Champlain region became a major battleground during the French and Indian War (1754-1763). In this war, England gained from France the control of Vermont and much of the rest of North America. See FRENCH AND INDIAN WARS.

Land Disputes. Benning Wentworth, the royal governor of New Hampshire, made 131 grants of Vermont land between 1749 and 1763. This land was called the *New Hampshire Grants*. But New York claimed the same land and granted it to other settlers. In 1764, England recognized the grants made by New York. England ordered settlers who held New Hampshire Grants to surrender their land or pay New York for it. In 1770, these settlers organized a military force called the *Green Mountain Boys* to defend their land. The Green Mountain Boys attacked many New York settlers and drove them from Vermont. See GREEN MOUNTAIN BOYS.

The Revolutionary War began in Massachusetts in 1775, before the Vermont land disputes were settled. Vermonters united to fight the British. Ethan Allen, Benedict Arnold, and more than 80 Green Mountain Boys captured Fort Ticonderoga from the British in May, 1775. Colonial troops held the fort until 1777, when the British drove them out. The troops retreated south from Fort Ticonderoga, with the British in pursuit. In Hubbardton, a rear guard led by Seth Warner stopped the retreat and fought the British. The rear guard was defeated. But the fighting delayed the British long enough to allow the rest of the colonists to escape.

The Battle of Bennington, on Aug. 16, 1777, was a major Revolutionary War conflict. It is often thought of as a Vermont battle. But it was actually fought just west of Vermont, in New York. The battles of Bennington and Saratoga (also in New York) marked the end of British land operations in the Northern Colonies.

Independent Republic. On Jan. 15, 1777, Vermont settlers declared their territory an independent republic. They named it *New Connecticut*. In July, 1777, Vermont adopted its first constitution and its present name.

New Hampshire and New York still claimed parts of Vermont. But Vermont ignored the claims. In 1783, George Washington wrote that he believed it would be necessary to send troops to overthrow the Vermont government. But this never happened, and Vermont remained an independent republic for 14 years. In 1790, Vermont settled its dispute with New York by paying that state $30,000. New Hampshire also gave up its claim to Vermont. Such improved relations with neighboring states helped clear the way for Vermont's admission to the Union. On March 4, 1791, Vermont became the 14th state.

IMPORTANT DATES IN VERMONT

1609 Samuel de Champlain claimed the Vermont region for France.

1724 Massachusetts established Fort Dummer, the first permanent white settlement in the Vermont region.

1763 England gained control of Vermont.

1775 Ethan Allen and the Green Mountain Boys captured Fort Ticonderoga from the British in the Revolutionary War.

1777 Vermont declared itself an independent republic.

1791 Vermont became the 14th state on March 4.

1823 The opening of the Champlain Canal created a water route from Vermont to New York City.

1864 Confederate soldiers raided St. Albans in the northernmost land action of the Civil War.

1881 Chester A. Arthur, born in Fairfield, became the 21st President of the United States.

1923 Calvin Coolidge, born in Plymouth Notch, became the 30th President of the United States.

1927 Vermont's worst flood killed 60 persons and caused millions of dollars in damage.

1962 Vermonters elected Philip H. Hoff, their first Democratic governor since 1853.

1964 Vermonters voted for Lyndon B. Johnson, the first Democrat they supported in a presidential election since 1824.

1970 The legislature passed the Land Use and Development Control Law, which gave the state the right to limit developments that could harm the environment.

The 1800's. During the War of 1812, Vermont volunteers fought the British in the battles of Chippewa, Lundy's Lane, and Plattsburgh. But the war was unpopular in Vermont, because trade with British-controlled Canada had become important to the state's economy. Hard times came to Vermont after the war. During a prosperous period from 1823 to 1836, many persons moved from Vermont to the growing Midwest. They feared future economic hardships in Vermont.

The Champlain Canal, which opened in 1823, connected Lake Champlain and New York's Hudson River. The canal allowed Vermont farmers to ship their goods by water all the way to New York City, a major market. Farmers in the Champlain Valley prospered, especially those who raised Spanish Merino sheep for wool. By 1840, Vermont had six times as many sheep as persons. Many small, water-powered mills were built in Vermont to process the wool from the sheep. During the mid-1800's, competition from Western states and other countries made wool prices drop. By 1860, Vermont farmers had sold half their sheep to be used as meat. This crisis caused Vermont to change from a sheep-raising state to a dairy-farming state.

During the Civil War (1861-1865), about 34,000 Vermonters served with the Union forces. The northern-

THE GOVERNORS OF VERMONT

	Party	Term
As an Independent Republic		
1. Thomas Chittenden	None	1778-1789
2. Moses Robinson	None	1789-1790
3. Thomas Chittenden	None	1790-1791
As a State		
1. Thomas Chittenden	None	1791-1797
2. Paul Brigham	None	1797
3. Isaac Tichenor	Federalist	1797-1807
4. Israel Smith	*Dem.-Rep.	1807-1808
5. Isaac Tichenor	Federalist	1808-1809
6. Jonas Galusha	*Dem.-Rep.	1809-1813
7. Martin Chittenden	Federalist	1813-1815
8. Jonas Galusha	*Dem.-Rep.	1815-1820
9. Richard Skinner	*Dem.-Rep.	1820-1823
10. Cornelius P. Van Ness	*Dem.-Rep.	1823-1826
11. Ezra Butler	†Nat. Rep.	1826-1828
12. Samuel C. Crafts	†Nat. Rep.	1828-1831
13. William A. Palmer	Anti-Masonic	1831-1835
14. Silas H. Jennison	Whig	1835-1841
15. Charles Paine	Whig	1841-1843
16. John Mattocks	Whig	1843-1844
17. William Slade	Whig	1844-1846
18. Horace Eaton	Whig	1846-1848
19. Carlos Coolidge	Whig	1848-1850
20. Charles K. Williams	Whig	1850-1852
21. Erastus Fairbanks	Whig	1852-1853
22. John S. Robinson	Democratic	1853-1854
23. Stephen Royce	Republican	1854-1856
24. Ryland Fletcher	Republican	1856-1858
25. Hiland Hall	Republican	1858-1860
26. Erastus Fairbanks	Republican	1860-1861
27. Frederick Holbrook	Republican	1861-1863
28. J. Gregory Smith	Republican	1863-1865
29. Paul Dillingham	Republican	1865-1867
30. John B. Page	Republican	1867-1869
31. Peter T. Washburn	Republican	1869-1870
32. George W. Hendee	Republican	1870
33. John W. Stewart	Republican	1870-1872
34. Julius Converse	Republican	1872-1874
35. Asahel Peck	Republican	1874-1876
36. Horace Fairbanks	Republican	1876-1878
37. Redfield Proctor	Republican	1878-1880
38. Roswell Farnham	Republican	1880-1882
39. John L. Barstow	Republican	1882-1884
40. Samuel E. Pingree	Republican	1884-1886
41. Ebenezer J. Ormsbee	Republican	1886-1888
42. William P. Dillingham	Republican	1888-1890
43. Carroll S. Page	Republican	1890-1892
44. Levi K. Fuller	Republican	1892-1894
45. Urban A. Woodbury	Republican	1894-1896
46. Josiah Grout	Republican	1896-1898
47. Edward C. Smith	Republican	1898-1900
48. William W. Stickney	Republican	1900-1902
49. John G. McCullough	Republican	1902-1904
50. Charles J. Bell	Republican	1904-1906
51. Fletcher D. Proctor	Republican	1906-1908
52. George H. Prouty	Republican	1908-1910
53. John A. Mead	Republican	1910-1912
54. Allen M. Fletcher	Republican	1912-1915
55. Charles W. Gates	Republican	1915-1917
56. Horace F. Graham	Republican	1917-1919
57. Percival W. Clement	Republican	1919-1921
58. James Hartness	Republican	1921-1923
59. Redfield Proctor	Republican	1923-1925
60. Franklin S. Billings	Republican	1925-1927
61. John E. Weeks	Republican	1927-1931
62. Stanley C. Wilson	Republican	1931-1935
63. Charles M. Smith	Republican	1935-1937
64. George D. Aiken	Republican	1937-1941
65. William H. Wills	Republican	1941-1945
66. Mortimer R. Proctor	Republican	1945-1947
67. Ernest W. Gibson	Republican	1947-1950
68. Harold J. Arthur	Republican	1950-1951
69. Lee E. Emerson	Republican	1951-1955
70. Joseph B. Johnson	Republican	1955-1959
71. Robert T. Stafford	Republican	1959-1961
72. F. Ray Keyser, Jr.	Republican	1961-1963
73. Philip H. Hoff	Democratic	1963-1969
74. Deane C. Davis	Republican	1969-1973
75. Thomas P. Salmon	Democratic	1973-

*Democratic-Republican †National Republican

most land action of the war took place in Vermont in 1864. A group of 22 Confederate soldiers raided banks in St. Albans, and fled to Canada with over $20,000.

Agriculture declined in Vermont after the war. More and more Vermont farmers left the state for cities, or for better farmland in the Midwest and elsewhere. Most of the French Canadians and Europeans who moved to Vermont settled in cities to work in factories. The late 1800's brought great growth to Vermont's wood-processing and cheese-making industries. Burlington grew rapidly as a port city that processed lumber from Canada and shipped it to U.S. cities. The granite industry boomed in Barre. Vermont's once important textile industry declined during the late 1800's. Many textile mills moved to the South, where labor costs were lower.

The Early 1900's. Manufacturing replaced agriculture as Vermont's most important economic activity during the early 1900's. The value of Vermont's manufactured products more than tripled between 1900 and 1920. Vermont factories supplied lumber, machinery, and other products for the armed forces after the United States entered World War I in 1917.

Vermont's tourist industry also grew rapidly during the early 1900's. Many large resort hotels and vacation camps were built. In 1911, Vermont became the first state with an official publicity bureau to attract tourists.

In 1923, Calvin Coolidge, born in Vermont, became the 30th President of the United States. He had been elected Vice-President under President Warren G. Harding, who died in office. Coolidge was a shy man who was quiet in public. To many persons, he seemed to be a "typical Vermont conservative."

The nationwide Great Depression of the 1930's brought severe hardship to Vermont. Many small factories and lumber mills closed. Vermont farmers were hurt by falling prices and reduced sales. Vermont's economy improved during the late 1930's.

The worst flood in Vermont history occurred in November, 1927. Waters from the Winooski River and branches of the Connecticut River swept away entire sections of towns. The flood caused 60 deaths and millions of dollars in damage.

The Mid-1900's. During World War II (1939-1945), Vermont factories again produced war materials. After the war, the state increased its efforts to attract new industries. The Vermont Development Department, established in 1949, promoted industrial development and tourism. The state's Municipal Bond Act of 1955 gave Vermont communities permission to issue revenue bonds. Money from the bonds financed industrial construction programs.

During the 1960's, a few large corporations built factories in Vermont. But most of the industry attracted to Vermont would be considered small in many

other states. Even firms with a dozen or so workers provide economic help to Vermont's small towns. An interstate highway from Massachusetts to the Canadian border, developed during the 1960's, contributed to the growth of industry and tourism in Vermont.

As Vermont manufacturing grew, agriculture became less important to the state's economy. Farms decreased in number and increased in size, and the population began to shift from rural to urban areas. In 1965, the Vermont legislature was *reapportioned* (redivided) to provide more equal representation based on population, and rural residents lost some power. The state Senate was reapportioned again in 1973.

Politically, Vermont remained a Republican center of strength. Republicans held such control in the state that the election of a few Democrats in the 1950's and 1960's made news throughout the country. William H. Meyer, elected to the U.S. House of Representatives in 1958, became the state's first Democratic congressman since 1853. Philip H. Hoff, who served as Vermont's governor from 1963 until 1969, was the first Democrat in that office since 1854. Since 1856, Vermont has given its electoral votes to the Republican nominee in every presidential election except the 1964 race. That year, the state supported Democrat Lyndon B. Johnson.

Vermont Today. Manufacturing and tourism continue to contribute greatly to Vermont's economy. The tourist industry, centered in the Green Mountains, brings more than $200 million a year to the state.

Vermont's major problem in the 1970's is to attract more industry and tourism and, at the same time, protect the state's natural resources and recreation areas. In 1970, the state legislature passed the Land Use and Development Control Law. This act gives the state the right to limit any development that could harm the environment.

The Democratic Party continued to gain strength in Vermont in the 1970's. Democrat Thomas Salmon won the governorship in 1972 and was re-elected in 1974. Also in 1974, Patrick J. Leahy became the first Democrat to be elected to the U.S. Senate from Vermont since the early 1800's.

THOMAS DAY SEYMOUR BASSETT,
J. ROWLAND ILLICK, and GORDON MILLS

VERMONT/*Study Aids*

Related Articles in WORLD BOOK include:

BIOGRAPHIES

Aiken, George D.
Allen, Ethan
Arthur, Chester A.
Champlain, Samuel de
Chittenden, Thomas
Collamer, Jacob
Coolidge, Calvin
Morrill, Justin S.
Warner, Seth

CITIES, TOWNS, AND VILLAGES

Barre
Burlington
Montpelier
Rutland
Saint Albans
Saint Johnsbury

PHYSICAL FEATURES

Connecticut River
Green Mountains
Lake Champlain
Lake Memphremagog

OTHER RELATED ARTICLES

Green Mountain Boys
New England

Outline

I. Government
- A. Constitution
- B. Executive
- C. Legislature
- D. Courts
- E. Local Government
- F. Taxation
- G. Politics

II. People

III. Education
- A. Schools
- B. Libraries
- C. Museums

IV. A Visitor's Guide
- A. Places to Visit
- B. Annual Events

V. The Land
- A. Land Regions
- B. Rivers and Lakes

VI. Climate

VII. Economy
- A. Natural Resources
- B. Manufacturing
- C. Agriculture
- D. Mining
- E. Electric Power
- F. Transportation
- G. Communication

VIII. History

Questions

How long was Vermont an independent republic? Who were the Green Mountain Boys?

What is Vermont's chief economic activity?

When did Vermont lose its claim to the Connecticut River? What state won this dispute?

How many Vermont towns have no local government? Why do they not have their own government?

What voting record did Vermont set from the 1850's until the 1960's?

Where did the northernmost land action of the Civil War take place?

Which U.S. presidents were born in Vermont?

Where was the first U.S. teacher-training school established? When?

Why was the War of 1812 unpopular in Vermont?

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VERMONT, UNIVERSITY OF, is a state-controlled coeducational school in Burlington, Vt. It has colleges of agriculture and home economics, arts and sciences, education, and technology. It also has a graduate college and a division of health sciences, which includes a college of medicine and schools of nursing and of allied health sciences. The university grants bachelor's, master's, and doctor's degrees. It was the first university in the United States to admit women to Phi Beta Kappa.

The University of Vermont was chartered in 1791. The Vermont Agricultural College was chartered in 1864, and joined with the University in 1865 to form the University of Vermont and State Agricultural College. For its enrollment, see UNIVERSITIES AND COLLEGES (table). L. E. VAN BENTHUYSEN

VERMOUTH. See ALCOHOLIC DRINK (Fermented Liquors).

VERNACULAR SCHOOL. See EDUCATION (The Renaissance; The Reformation).

VERNAL EQUINOX. See EQUINOX.

VERNAL FALLS. See YOSEMITE NATIONAL PARK (Waterfalls); WATERFALL (chart).

VERNE, JULES (1828-1905), a French novelist, wrote some of the first science fiction stories. Although his books were written before the invention of the airplane, they remain popular in the space age. Verne forecast the invention of airplanes, submarines, television, guided missiles, and man-made space satellites. He even predicted their uses accurately.

Brown Bros.

Jules Verne

Verne cleverly used realistic detail and believable explanations to support incredible tales of adventure. His fantastic plots took advantage of the widespread interest in science in the 1800's. He carried his readers all over the earth, under it, and above it. Verne's *Twenty Thousand Leagues Under the Sea*, published in 1870, tells about Captain Nemo, a mad sea captain who cruises beneath the oceans in a submarine. In *Around the World in Eighty Days* (1873), Phileas Fogg travels around the earth in the then unheard-of time of 80 days, just to win a bet. Other thrillers include *A Journey to the Center of the Earth* (1864), *From the Earth to the Moon* (1865), and *Around the Moon* (1870).

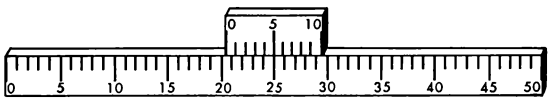
Verne knew a great deal about geography, and used his knowledge to make his stories realistic. He also wrote several historical novels, including a story about the U.S. Civil War, *North Against South* (1887).

Verne was born in Nantes. He studied law in Paris but decided to become a writer. His first works were plays and the words for operas. Verne's first novel, *Five Weeks in a Balloon* (1863), brought him immediate success. It was based on an essay he wrote describing the exploration of Africa in a balloon. The essay was rejected several times before one publisher suggested that Verne rewrite it as a novel of imagination. The popularity of the book encouraged Verne to continue writing on science fiction themes. IRVING PUTTER

VERNIER, *VUR nih er*, is an instrument used in measuring lengths and angles. It is named for Pierre Vernier, a French mathematician who invented it in the 1600's.

The most common vernier has a short graduated scale, or "ruler," which slides along a longer scale. The subdivisions on the short rule are nine-tenths as long as the subdivisions on the long scale. Nine small divisions on the large scale are equal to 10 on the small scale.

In using the vernier, the large scale is laid along the material to be measured, a small pipe, for example. The small scale is slid until it reaches the end of the pipe. Now we check to see which of its divisions lines up with one of the divisions on the large scale. Suppose the 5, or fifth division from the zero end of the small scale, lines up with 25 on the large scale. Since each division on the small scale is one-tenth smaller than the large divisions, five divisions are equal to only four and one-half on the large scale. Therefore, the end of the small scale rests at 25−4.5, or 20.5 on the large scale.



The Vernier Scale Measures Lengths and Angles.

Engineers often use calipers with a vernier attachment (see CALIPER). Some read to $\frac{1}{1000}$ inch (0.0254 millimeter) without a magnifier. The caliper's beam is divided into inches and tenths, and each tenth is divided into fourths. The vernier is divided into 25 parts. The beam may be divided into fiftieths of an inch. The vernier has 20 divisions to each of its 19. HERMAN J. SHEA

VERNON, MOUNT. See MOUNT VERNON (Va.).

VERONA, *vuh RO nuh* (pop. 230,907), is an Italian city on the Adige River. It lies near the Tirolese Alps, 71 miles (114 kilometers) west of Venice. For location, see ITALY (political map). Shakespeare used Verona as the scene of his play *Romeo and Juliet*. The house in which Juliet is said to have lived still stands.

Verona presents a fascinating combination of ancient, medieval, and modern civilizations. The city was a prosperous Roman colony before the time of Christ, and still has many Roman ruins, including an amphitheater built by the Emperor Diocletian. In the Middle Ages, Verona was a major art center. It has an active trade in wine, fruits, and marble. SHEPARD B. CLOUGH

See also ITALY (color picture: Opera).

VERONAL. See BARBITURATE.

VERONESE, *VAY roh NAY say*, **PAOLO** (1528-1588), painted in and around Venice at the end of the Italian Renaissance. His real name was Paolo Cagliari, but he was called Veronese because he was born in Verona. He became most popular for his paintings of historical subjects and myths, and for representations of the life of Venetian aristocrats. He also painted religious subjects and portraits. His figures are robust and handsome, splendidly costumed, and theatrically posed in rich settings. His major works include *Marriage at Cana* in the Louvre in Paris; *Mars and Venus* in the Metropolitan Museum of Art, New York City; and frescoes in the Villa Maser, near Venice. ROBERT O. PARKS

See also OLD TESTAMENT (picture).

VERONICA, *vuh RON ih kuh,* **SAINT,** is traditionally supposed to have been one of the women of Jerusalem who followed Christ on His way to Calvary. She is said to have offered Christ her linen veil, to wipe the sweat from His face. Tradition has it that the imprint of His features remained on the cloth, and the miraculous relic is said to have been preserved in Rome since the year 700. It was exhibited in Saint Peter's in 1854. But other cities also claim to possess this relic. Saint Veronica's feast day is July 12. FULTON J. SHEEN

VERRAZANO, *VAIR rah TSAH noh,* **GIOVANNI DA** (1485?-1527?), an Italian navigator and pirate, is believed to have sailed to America in 1524. About 1521, he is thought to have served France, attacking Spanish ships. In 1523, King Francis I of France supposedly commissioned him to explore the shores of America. He may have touched the North Carolina shore. Historians believe he entered New York harbor, reached the Hudson River, and explored the New England coast. He was born near Florence. It is believed that he was killed by Indians in Brazil. FRANKLIN L. FORD

VERRAZANO-NARROWS BRIDGE is one of the world's longest suspension bridges. It spans the Narrows channel between Brooklyn and Staten Island in New York City. The center span of the $325 million bridge is 4,260 feet (1,298 meters) long. See also STATEN ISLAND (picture). WILLIAM E. YOUNG

VERRES, GAIUS. See CICERO, MARCUS TULLIUS.

VERROCCHIO, *vuh RAWK ee oh,* **ANDREA DEL** (1435-1488), was an Italian sculptor and painter. One of his early great works is a standing figure of David with the head of Goliath at his feet. The work shows how Verrocchio, by means of his knowledge of anatomy, controlled the muscles of David's body and face to enrich the meaning of his subject. The bronze group, *Christ and St. Thomas,* demonstrates the artist's mastery of psychology in the hesitancy of Thomas' stride and gesture in contrast to the calm and poise of Christ.

Verrocchio's large bronze of Bartolommeo Colleoni is sometimes called the world's finest *equestrian statue* (statue of a man on a horse). It appears in color in the SCULPTURE article. His one unquestioned painting, *The Baptism of Christ,* appears in the JOHN THE BAPTIST article. The angel on the left was probably painted by his pupil Leonardo da Vinci. G. HAYDN HUNTLEY

VERSAILLES, *vehr SY,* or *vur SAYLZ* (pop. 90,829), is a city in northern France. It lies 12 miles (19 kilometers) southwest of Paris (see FRANCE [political map]). It is famous as the site of the historic palace of Versailles, built by King Louis XIV. Versailles is also the capital of the Seine-et-Oise department, and a center of education.

The Versailles Palace is more than $\frac{1}{2}$ mile (0.8 kilometer) long and has enormous wings. It contains hundreds of rooms, including the famous Hall of Mirrors. The reception rooms of Louis XIV show the splendor of his time. Other rooms in the palace show the ornate style of the Louis XV period and the delicate work of the reign of Louis XVI.

The park of Versailles was laid out by the famous garden designer André Le Nôtre in a formal pattern of lawns, walks, and fountains. In its center, a broad walk called the *tapis vert* (green carpet) leads to the Grand Canal, which is 1 mile (1.6 kilometers) long. One branch of the canal leads toward the Grand Trianon and Petit Trianon, two small palaces which Louis XIV and Louis XV built for their favorite court ladies.

History. Originally, Versailles was the site of a modest hunting lodge built by Louis XIII. In 1661, Louis XIV began building a palace on the same location. He hired the best architects, sculptors, and landscape gardeners. Historians estimate he spent more than $100 million on the palace. Later kings added more rooms.

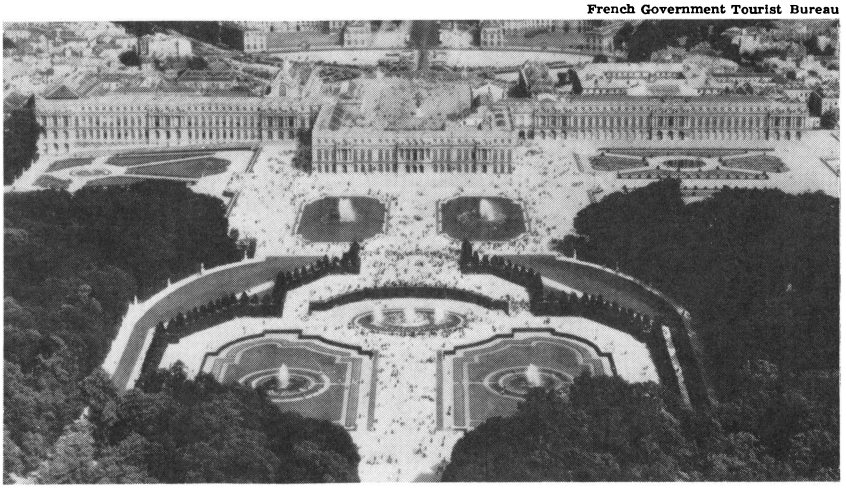
The luxury and wastefulness of court life at Versailles helped bring about the French Revolution. In 1789, the States-General met at Versailles. This meeting signaled the beginning of the Revolution.

The German Army made Versailles its headquarters during the siege of Paris in 1870-1871. At the end of the Franco-Prussian War, Versailles was the capital of France for a time. The Treaty of Versailles was signed in the Hall of Mirrors after World War I.

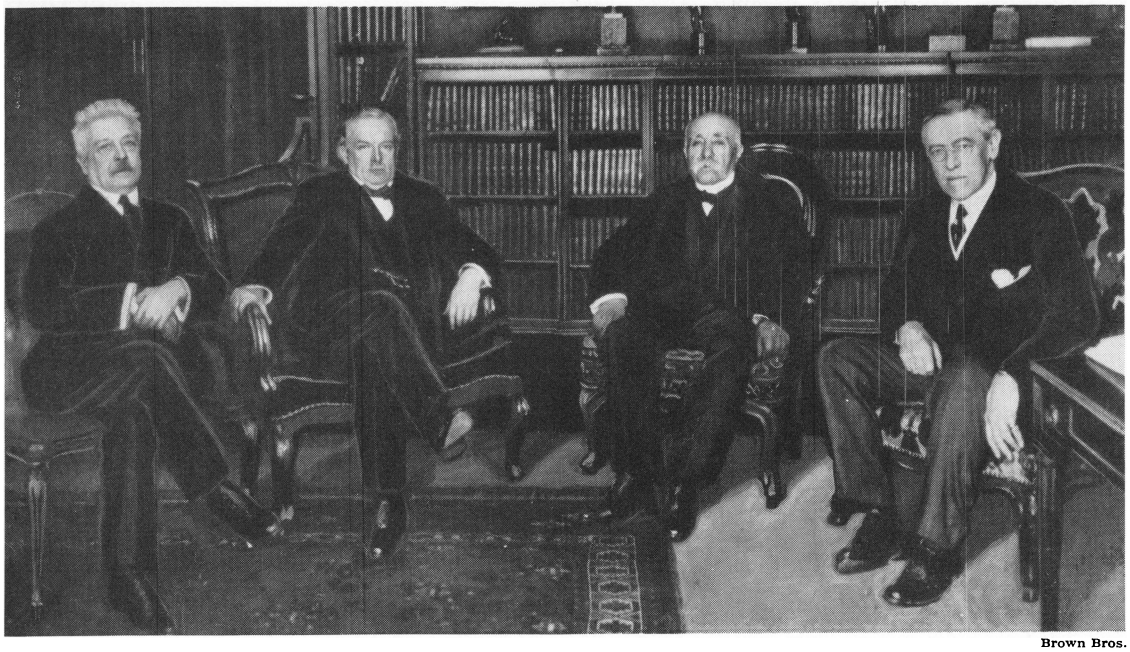
In the 1920's, John D. Rockefeller, Jr., gave France $2,850,000, part of which was used to restore the Versailles palace and park to their original appearance. The palace is now a national museum. ROBERT E. DICKINSON

See also ARCHITECTURE (picture: Palace of Versailles); FRANCE (picture: Historic French Furniture).

French Government Tourist Bureau



The Palace of Versailles was built by Louis XIV in the 1600's. Now a national museum, it contains exhibits of fine painting and sculpture.



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The Treaty of Versailles marked the official end of World War I. Thirty-two Allied countries took part in drawing up the document. The four statesmen shown above took charge of major negotiations. They are, *left to right,* Premier Vittorio Orlando of Italy, Prime Minister David Lloyd George of Great Britain, Premier Georges Clemenceau of France, and President Woodrow Wilson of the United States. The treaty was signed in 1919 by all the great powers except the United States.

VERSAILLES, TREATY OF, officially ended World War I. Fighting ended when Germany accepted the Armistice of Nov. 11, 1918. But the war did not officially end until the Treaty of Versailles went into effect on Jan. 10, 1920. The treaty was signed on June 28, 1919, in the Hall of Mirrors of the Palace of Versailles, near Paris.

Thirty-two allied countries took part in negotiating the treaty. The United States played an important part in drawing it up. President Woodrow Wilson and Premiers David Lloyd George of Great Britain and Georges Clemenceau of France were known as the "Big Three" because they almost completely controlled the course of negotiations. But the United States never ratified the Versailles Treaty. The Senate refused to give its consent. Instead, the United States made a separate treaty of peace with Germany in 1921. This treaty reserved for the U.S. all the advantages it might have had under the Versailles Treaty, but accepted none of the obligations.

Making the Treaty. The people of the defeated countries, and most other people, expected that the treaty of peace would be based upon the famous Fourteen Points set forth by President Wilson in his speech of Jan. 8, 1918 (see WILSON, WOODROW [The Fourteen Points]). They soon learned that this was impossible, for several of the Allies had entered into secret agreements during the war which affected boundaries, the distribution of territory, and many other matters.

From the beginning, it was clear that no one would have much to say about the terms of the treaty except the five "great powers," the United States, Great Britain, France, Italy, and Japan. President Wilson was so eager to see a League of Nations established that he yielded many of the other points in order to protect this one. As a result, most of the provisions of the treaty were compromises that came nearer the desires of France and Great Britain than those of Wilson.

Provisions of the Treaty. The four outstanding provisions of the treaty revised boundaries, set reparations, disarmed Germany, and established the League of Nations (see LEAGUE OF NATIONS). Germany lost the province of Alsace, the German-controlled portion of Lorraine, much of Schleswig, the districts of Eupen and Malmédy, southeastern Silesia, Posen, and a strip of West Prussia, which was granted to Poland as a corridor to the sea. The mouth of the Memel River and the surrounding territory was ceded to the Allies and later transferred to Lithuania. The city of Danzig, taken from Germany, became a free city under the jurisdiction of the League of Nations. Germany lost all its overseas colonies, and its rights in Turkey and China. The Saar Valley, with its valuable coal fields, was placed under control of the League of Nations for 15 years. The Rhineland was to be demilitarized. Parts of it were to be occupied for as long as 15 years in order to assure Germany's good behavior.

Reparations. Germany had to turn over to the Allies livestock for the farms the German armies had laid waste, ships, railroad cars, locomotives, and other materials to replace those destroyed during the war, and large quantities of coal to repay France for the losses in its own mines. Germany was also required to pay large yearly sums in cash.

The treaty did not decide on the total amount of these cash payments. Instead, it provided for a reparations commission to determine the actual sum and to arrange the details of payment. In 1921 the figure was set at 132 billion gold marks, or about $33 billion.

Efforts to collect the reparations failed. The Dawes

Plan in 1924 and the Young Plan in 1929 also failed to solve this problem. In 1932 the Lausanne Agreement brought reparations payments to an end.

Ratification. The first German representatives sent to sign the peace treaty resigned when they found out what was in it. A few slight changes, such as the provision for a *plebiscite* (popular vote) in Silesia, were made in response to their objections. The Allies also threatened to take over more German territory if the German government refused to sign. A second German delegation signed the treaty, and after hot debate the German Reichstag approved it. All the great Allied powers, except for the United States, ratified the Treaty of Versailles. DWIGHT E. LEE

See also TRIANON, TREATY OF; WORLD WAR II (Problems Left by World War I).

VERSE, BLANK. See BLANK VERSE.

VERSE, FREE. See FREE VERSE.

VERSO. See BOOK (Parts of a Book).

VERST is a measure of distance used in Russia. It equals 0.66288 mile (1.06680 kilometers).

VERTEBRA, *VER tuh bruh,* is any one of the bones that make up the spinal column. A child has 33 vertebrae. But an adult has 26, because several of them unite in later life (see SPINE). Some long-tailed vertebrate animals have many more vertebrae than a child or adult.

A vertebra has a central body with a *pedicle* (bony extension) on each side. The pedicles join bilateral *laminae* to form an *arch* enclosing an opening called the *vertebral foramen.* The spinal cord passes through this opening. A *spinous process* and two *transverse processes* extend from the arch. The transverse processes bear *articular processes* that connect with the articular processes of adjoining vertebra. GORDON FARRELL

VERTEBRATE, *VUR tuh brayt,* is an animal with a backbone and *cranium* (brain case). There are seven living classes of vertebrates: (1) the lamprey and its relatives, *Agnatha;* (2) the shark and other cartilaginous fish, *Chondrichthyes;* (3) the bony fish, *Osteichthyes;* (4) the frog and other amphibians, *Amphibia;* (5) reptiles, *Reptilia;* (6) birds, *Aves;* and (7) mammals, *Mammalia.*

Most vertebrates have a bony backbone called a *spinal column.* The spinal column is made of bones called *vertebrae* (see SPINE). But some, such as the shark, do not have bones. Sharks have a spinal column of *cartilage* (waxy tissue). Some scientists prefer to call the group *Craniata* because all vertebrates have a cranium.

All vertebrates are *bilaterally symmetrical.* That is, the left and right sides of the body are alike. The body is usually divided into a head and a trunk. The more advanced land vertebrates have a neck. In *mammals* (animals with milk glands for feeding their young) the trunk is divided into a *thorax* (chest) and abdomen. Vertebrates never have more than two pair of limbs.

Scientific Classification. Vertebrates are classified in the phylum *Chordata,* and make up the subphylum *Vertebrata.* WILLIAM V. MAYER

Related Articles in WORLD BOOK include:

Amphibian	Chordate	Lamprey	Shark
Amphioxus	Fish	Mammal	Skate
Bird	Invertebrate	Reptile	Tail

VERTEX. See ANGLE.

VERTICAL TAKE-OFF AIRCRAFT. See CONVERTIPLANE; HELICOPTER.

VERTIGO. See DIZZINESS.

VERTUMNUS. See POMONA.

VERVAIN. See VERBENA.

VERWOERD, HENDRIK F. See SOUTH AFRICA (Opposition to Apartheid).

VERY HIGH FREQUENCY WAVE (VHF) refers to the band of electromagnetic waves that range in frequency from 30 megahertz (30 million cycles per second) to 300 megahertz (300 million cycles per second). VHF wave lengths range from 1 to 10 meters. The Federal Communications Commission has assigned portions of the VHF band to TV and FM stations and to "ham" radio operators. The VHF band assigned to TV ranges from 54 to 216 megahertz. The VHF band assigned to FM ranges from 88 to 108 megahertz. VHF waves travel in straight lines, like light waves. For this reason, their transmission is ordinarily limited to line-of-sight paths. Otherwise, obstructions, such as buildings, reflect them. See also FREQUENCY MODULATION; SHORT WAVE; TELEVISION (Broadcasting). SAMUEL SEELY

VERY PISTOL. See PISTOL; FIREWORKS.

VESALIUS, *vih SAY lee us,* **ANDREAS** (1514-1564), was one of the foremost anatomists of all time. His book, *Concerning the Fabric of the Human Body,* or *Fabrica* (1543), contained the first complete description of the human body. For this, he is called the *father of anatomy.*

Vesalius became a professor at the University of Padua at the age of 23. Because he dared to correct many of Claudius Galen's errors based on animal dissection, followers of Galen bitterly attacked him. Discouraged, he burned most of his writings and resigned from Padua in 1544. He later became physician to Charles V and Philip II of Spain. Vesalius was born in Brussels, in what is now Belgium. He started his anatomical studies by dissecting the bodies of dead criminals. CAROLINE A. CHANDLER

See also MEDICINE (The Renaissance; picture: The Scientific Study of Anatomy).

VESEY, *VEE zih,* **DENMARK** (c.1767-1822), a Negro freedman, planned a slave revolt that involved more blacks than any other uprising in United States history. The revolt never took place. But the threat of it caused South Carolina to pass severe laws restricting the education, movement, and occupation of both freedmen and slaves.

In 1822, Vesey organized about 9,000 freedmen and slaves and prepared to attack several South Carolina cities. But some of the slaves told their masters. Several blacks were arrested and gave information that led to the capture of Vesey and several other leaders in the plot. Vesey and about 35 followers were hanged, and about 35 others were sold to West Indian plantation owners.

Historians know little about Vesey's early life. In 1800, he bought his freedom from his owner. He then worked as a carpenter in Charleston, S.C., until he started to plan the revolt. FRANK OTTO GATELL

VESPA. See WASP (Social Wasps).

VESPASIAN, *ves PAY zhun* (A.D. 9-79), was a Roman emperor. Rome prospered under his rule. He set up new taxes and supervised their collection, thereby restoring the empire's financial condition. He built a new forum, the famous Colosseum, and other buildings (see FORUM, ROMAN; COLOSSEUM). He also founded professorships to encourage education.

Vespasian was born near Reate, a city northeast of Rome. His full name was TITUS FLAVIUS VESPASIANUS. He became a general, and in A.D. 67 Emperor Nero sent him to put down a Jewish rebellion in Judea. During the year after Nero's death (A.D. 68), Generals Galba, Otho, and Vitellius followed one another as emperor. Finally, Vespasian's troops proclaimed him emperor in A.D. 69, and he went to Rome. There, the Senate passed the *Lex de imperio Vespasiani*, the first written statement of the powers of a Roman emperor. He was succeeded by his son, Titus. MARY FRANCIS GYLES

VESPER. See EVENING STAR.

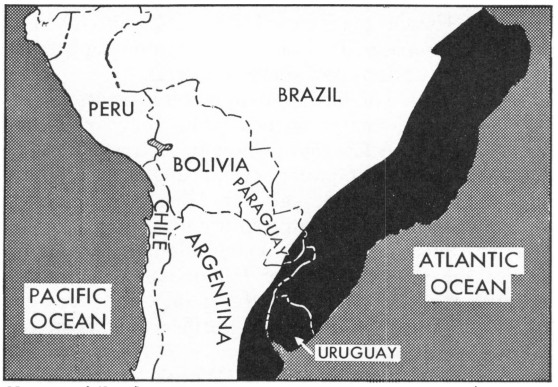
VESPERS is the principal evening service of the breviary (see BREVIARY). Scholars believe that this hour may correspond to the evening sacrifice described in the Old Testament. Some scholars believe that it commemorates the descent from the cross.

VESPUCCI, *ves POO chee*, **AMERIGO** (1451-1512), an Italian merchant-explorer, claimed to have discovered the continent of America in 1497. In 1492 Christopher Columbus had no idea he reached the Western Hemisphere. He thought that the islands he explored were part of the Indies. He first set foot on the mainland of America on his third voyage in 1498.

When Vespucci claimed that he had discovered the new continent, or the New World, as it was called, Columbus did not dispute his claim. Vespucci's letters describing his discovery were published, and in 1507 someone suggested that the new continent, which was actually South America, be named *America* "because Amerigo discovered it." Scholars no longer believe he was the actual discoverer, but his name was accepted for South America, and gradually came into use for North America as well.

Vespucci was born in Florence and was educated by his uncle, a Dominican priest. He became interested in astronomy and learned all that he could about the subject. For a time he was a merchant in Florence, and later in Seville and Cadiz, Spain. In 1495 he became connected with a firm which fitted out ships for long voyages. He claimed he made voyages in 1497, 1499, 1501, and 1503. The first two were for Spain, and the last two for Portugal. Vespucci did not take a leading part in these expeditions. He was only a pilot, or *astronomer*, as pilots were then called. In 1505 Vespucci became a Spanish subject and from 1508 until his death he was chief pilot of Spain. FRANKLIN L. FORD

See also AMERICA; COLUMBUS, CHRISTOPHER.



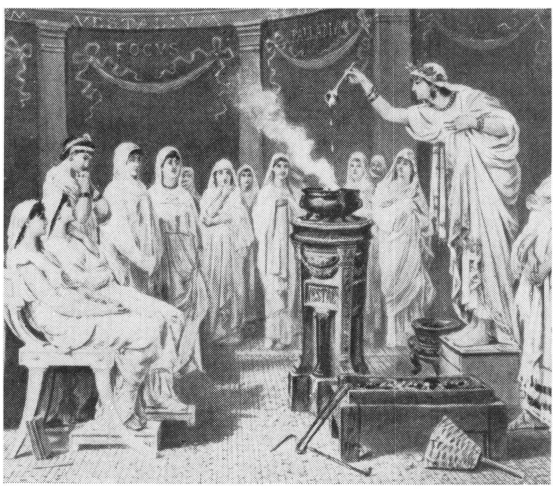
Vespucci Explored the Coast of South America (the area shown in black) in 1497. It was first called the New World.

Brown Bros.

Amerigo Vespucci Gave His Name to America.

VESTA was the goddess of fire on the hearths of home and state in Roman mythology. She resembled the Greek goddess Hestia. She was the oldest daughter of Saturn, the god of the harvest, and Ops, the goddess of the growth of natural things (see SATURN). Vesta was also the sister of Jupiter, the king of the gods (see JUPITER). Vesta never married, but watched over the life of the home, and each house had a shrine to her. She was the symbol of the home, and every meal began and ended with an offering to her.

Every city had a public hearth where a fire burned to



Joseph Boggs Beale, Modern Enterprises

Young Vestal Virgins in the Temple of Vesta are shown how the sacred fire is tended, to keep it burning always.

Vesta. Persons who left the city took some of the old fire with them to start the new fire in their homes. A circular temple to Vesta stood in the center of Rome. A sacred fire, guarded by six young *vestal virgins*, burned there constantly. The Romans believed the fire was a safeguard against national disaster.

Living conditions in primitive times partly explain the worship of Vesta. Fires were hard to make, and for that reason, one was always kept burning. People obtained fire from the chief or ruler, whose daughters kept it burning. After fire-making became simple, these customs remained as symbols.

The festivals of Vesta, called *Vestalia*, were held on June 9. The worship of Vesta in homes was closely associated with that of the *Lares*, or the spirits of ancestors, and *Penates*, the gods of the hearth (see LARES AND PENATES). NATHAN DANE II

VESTIBULE, or **VESTIBULAR CANAL.** See EAR (The Inner Ear; picture).

VESUVIUS, *veh SOO vih us*, is the only active volcano on the mainland of Europe. It is probably the most famous volcano in the world. It rises on the Bay of Naples, about 7 miles (11 kilometers) southeast of the city of Naples. Vesuvius has been studied by scientists more than any other volcano because it erupts frequently and is easy to reach.

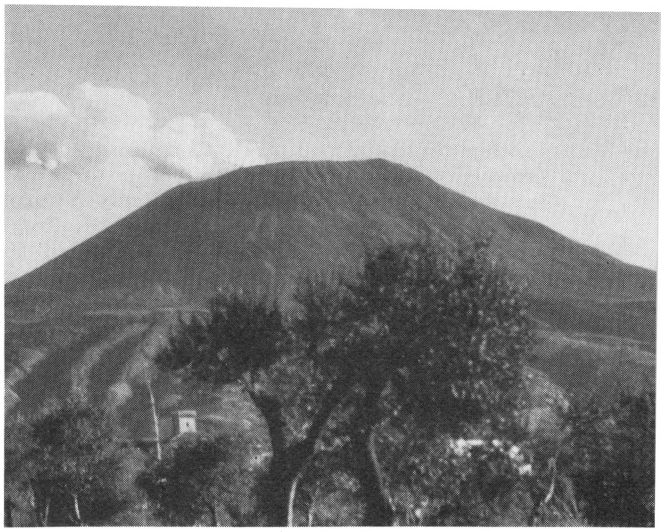
Vesuvius is a cone within the rim of Mount Somma, a big crater formed when the top of the mountain collapsed in the eruption of A.D. 79. The height of Vesuvius changes with each eruption. In June, 1900, the cone was 4,275 feet (1,303 meters) high. But after the eruption of 1906, it was only 3,842 feet (1,171 meters) high. The top of the active cone is a cup-shaped crater, ranging from 50 to 400 feet (15 to 120 meters) across. Vesuvius spouts columns of steam, cinders, and sometimes small amounts of lava into the air.

Many people live on the lower slopes of the mountain and on the plains at its foot, in spite of Vesuvius' history of disastrous eruptions. The soil is extremely fertile and the area is famous for its vineyards of wine grapes.

Early Eruptions. Early man probably saw Vesuvius in eruption. Roman legends say that the gods had once used the mountain as a battleground, but at the time of Christ it had been dormant for hundreds of years. A series of earthquakes alarmed the people in the neighborhood of Vesuvius for 16 years following A.D. 63. The first recorded eruption occurred on Aug. 24, A.D. 79, when the cities of Herculaneum, Pompeii, and Stabiae were covered by ashes and lava. An eyewitness account of the disaster has come down to us from the Roman author, Pliny the Younger. His uncle, Pliny the Elder, was killed during the eruption.

In 472, ashes poured from the crater in such great amounts that they were carried by the wind as far as Constantinople (now Istanbul). Streams of lava and boiling water fell on the villages at the foot of the mountain in 1631. About 18,000 persons were said to have died. There were other destructive eruptions in 1794, 1822, 1855, 1872, 1880, 1895, 1906, 1929, and 1944.

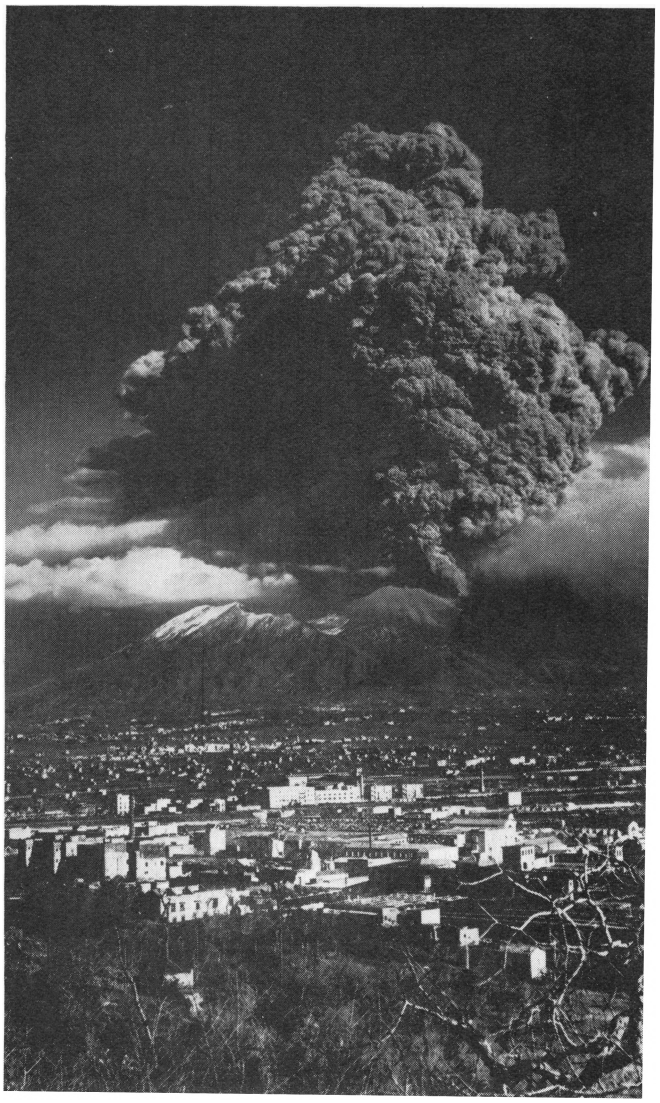
Recent Eruptions. The greatest destruction in recent years occurred in April, 1906, when several towns were destroyed. In the eruption of March, 1944, which destroyed the village of San Sebastiano, soldiers of the Allied armies helped the people of nearby towns escape the lava and volcanic dust.



Ewing Galloway; U.S. Navy, Black Star

A Plume of White Smoke Drifts from Vesuvius and over the farms and vineyards that nestle on its slopes. Despite the danger of eruptions, farmers make their homes there.

Vesuvius in Eruption is a sight that arouses awe and wonder. Great clouds of volcanic dust are blown from the crater and lava pours over its edges. This is the great eruption of 1944.



Before the eruption of 1944, thousands of visitors came to Vesuvius every year. They could go down into the crater for some distance and see a crimson stream of lava flow from the cone and turn into a bed of cold stone. A cable railway which took visitors to within 450 feet (137 meters) of the edge of the crater was destroyed in this eruption. Many people still visit the area.

A Royal Observatory was established on the slopes of the mountain in 1844. Since that time scientists have kept a constant watch over the volcano during and between eruptions. One observer lost his life standing by his post, and another probably had his life shortened by the effects of poison gases. GORDON A. MACDONALD

See also HERCULANEUM; MOUNTAIN (table; picture chart); NAPLES; POMPEII; VOLCANO.

VETCH is the common name of a group of leguminous plants. Vetches are used for hay, for green manure, as pasture crops, for silage, and as a cover crop for orchards. There are many different kinds of vetch. *Common vetch*, or *tare*, is the most common in the United States, and hairy vetch also grows widely. Purple vetch is becoming important in the Pacific Coast States. Certain flowering vetches are grown for ornamental purposes. Some Europeans eat vetch beans.

Vetches have weak stems which trail across the ground. Farmers often sow oats and rye with vetches because the stiff stems of these plants help to keep the vetch plants off the ground. Vetches require a cool growing season. They grow most successfully in well-drained loam or sandy loam soil. Only hairy vetch can survive a very cold winter. The *vetch bruchid*, a small weevil, destroys the green seed of some vetches.

Scientific Classification. Vetches are of the pea family, *Leguminosae*. Common vetches are genus *Vicia*, species *V. sativa*. Hairy vetches are *V. villosa*. Purple vetches are *V. atropurpurea*. ROY G. WIGGANS

Leaves and Blossoms of Vetch. The plant is highly valuable as a cattle food, and for renewing soil fertility.

N.Y. Botanical Garden

VETERANS ADMINISTRATION (VA) administers all laws covering benefits and services to nearly 27 million former members of the United States armed forces. The VA also provides these benefits and services for eligible members of the families of deceased veterans. The agency has charge of pensions and compensation payments, education and training, vocational rehabilitation for disabled veterans, and veterans' hospitals and soldiers' homes. It administers government insurance for former servicemen who served before October, 1965, and a mortgage guaranty program for the purchase of homes or farms.

The VA program was created by the Servicemen's Readjustment Act of 1944. It has been amended to give similar benefits to veterans of the Korean War, of the period after the Korean War, and of the Vietnam War. The VA has 57 regional offices, with at least one in each state. There are 166 veterans' hospitals, located in all states except Alaska and Hawaii. The regional offices and the hospitals are staffed by about 170,000 employees.

Benefits and Other Services. The VA pays about $3 billion yearly in compensation or pension benefits to 4,600,000 veterans and dependents of deceased veterans. An average of 92,000 patients receive care every day in VA hospitals. More than 5,600,000 veterans have VA insurance policies valued at over $38 billion.

The agency also guarantees home and farm loans. Loans totaling $74 billion have been made to more than 7,424,000 veterans. The VA provided business loans to World War II and Korean War veterans.

The VA administers an educational training program that has served 7,800,000 World War II and 2,391,000 Korean War veterans at the college and vocational school levels. The Veterans' Readjustment acts of 1966 and 1967 provided similar educational opportunities and loan mortgage privileges for post-Korean War veterans. These laws benefit men and women who have served more than 180 days on active duty since Jan. 31, 1955. The VA pays a minimum monthly educational assistance allowance of $175 to veterans attending school full time.

History. Veterans of the Revolutionary War received pensions under laws adopted in 1792, 1818, and 1828. Temporary help had already been given to these veterans in the form of cash bonuses and land grants. The office of the Commissioner of Pensions was set up in 1849 to administer all military pension laws under the direction of the secretary of the interior. The first United States Soldiers' Home was established in Washington, D.C., in 1851. Its purpose was to provide a home for invalid or disabled soldiers. Congress established three soldiers' homes in 1866, after the Civil War. Later, 10 more soldiers' homes were set up. A Confederate Soldiers' Home was established in Little Rock, Ark., in 1891, and was taken over by the state in 1893. The Maryland Line Confederate Soldiers' Home, founded in Pikesville, Md., in 1888, was closed in 1932.

Today, the VA operates homes called *domiciliaries* for veterans who do not require hospital care, but who are unable to earn a living and have no adequate means of support. These homes are in Bath, N.Y.; Bay Pines, Fla.; Biloxi, Miss.; Bonham, Tex.; Dayton, Ohio; Dublin, Ga.; Hot Springs, S.Dak.; Hampton, Va.; Los

Angeles, Calif.; Martinsburg, W.Va.; Mountain Home, Tenn.; Prescott, Ariz.; Temple, Tex.; Wadsworth, Kans.; White City, Ore.; and Wood, Wis.

During World War I, the Bureau of War Risk Insurance was created under the War Risk Insurance Act. The bureau administered insurance against death or disability of members of the armed forces. The act also set up the Federal Board for Vocational Education to provide vocational rehabilitation for disabled veterans. Five governmental agencies, including the United States Public Health Service, were now serving the needs of veterans. To eliminate the duplication, Congress created the Veterans Bureau in 1920. In 1930, the Veterans Administration was created by combining the Veterans Bureau with the National Home for Disabled Volunteer Soldiers and the Bureau of Pensions.

Critically reviewed by the VETERANS ADMINISTRATION

See also GI BILL OF RIGHTS; HOUSE (Financing a House); PENSION (Military Pensions); WAR RISK INSURANCE.

VETERANS' BONUS. See BONUS (Other Bonuses).

VETERANS DAY honors men and women who have served in the United States armed services. Until 1971, it was celebrated on November 11, but most states now celebrate it on the fourth Monday in October. Great Britain and France, celebrate November 11 as Armistice Day to commemorate the end of fighting in World War I on Nov. 11, 1918. Canada observes Remembrance Day on November 11 (see REMEMBRANCE DAY).

Veterans Day celebrations in the United States include parades and speeches. Special services are held at the Tomb of the Unknown Soldier in Arlington National Cemetery, Arlington, Va. In 1919, President Woodrow Wilson proclaimed November 11 as Armistice Day to remind Americans of the tragedies of war. A law adopted in 1938 made the day a federal holiday. In 1954, Congress changed the name to Veterans Day to honor all United States veterans. RAYMOND HOYT JAHN

VETERANS OF FOREIGN WARS OF THE UNITED STATES (VFW) is one of the largest veterans' organizations in the United States. It seeks to develop comradeship among its members, assist needy veterans and their widows and children, organize memorial services for deceased veterans, and promote patriotism and community activity programs. The organization has about 1,800,000 members in the United States and in other countries.

Any officer or enlisted man, either on active duty in the armed services or honorably discharged, who fought in any foreign military campaign of the United States, may join the VFW. The membership includes veterans of the Spanish-American War, the Boxer Rebellion, the Philippine Insurrection, campaigns on the Mexican border, Nicaraguan expeditions, World Wars I and II, the Korean War, and the Vietnam War.

The annual national convention governs the VFW. Convention delegates determine the organization's policies. They also elect a commander in chief to head the VFW. A national council of administration represents the convention between sessions.

The VFW National Home for Veterans' Orphans at Eaton Rapids, Mich., provides care for the children of deceased veterans. It has family-size houses, a hospital, a swimming pool, a gymnasium, a nursery, and a community social center. VFW posts in the United States sponsor Buddy Poppy sales yearly. Part of the proceeds helps support the home.

The Military Order of the Cooties is the honor branch of the VFW. Only those members who have made outstanding contributions toward furthering the objectives of the VFW may qualify for the order. Members of the Military Order of the Cooties devote their time to helping veterans in hospitals.

National Headquarters, VFW

VFW Emblem

The Ladies Auxiliary to the Veterans of Foreign Wars is a women's organization devoted to community service and patriotism. The auxiliary assists the VFW with many of its programs, including yearly Buddy Poppy sales, and helps support the VFW National Home. Any woman with a close relative who is eligible to join the VFW may join the VFW Auxiliary. Any woman who herself fought in a foreign war may also join. The organization has about 650,000 members in more than 6,800 local units.

The first attempts to form organizations of veterans of foreign wars began in the late 1890's. Three organizations combined in 1913 to form the VFW. Headquarters are at 34th Street and Broadway, Kansas City, Mo. 64111.

Bob Dewey, *The Cootie Courier*

The VFW's Military Order of the Cooties is an honor branch. Members devote their time to helping hospitalized veterans.

Critically reviewed by the VFW

VETERANS' ORGANIZATIONS include former members of a nation's armed services. They may limit membership to veterans who served during a particular war or military campaign. Or the organizations may accept only veterans who fought overseas, or were disabled.

Veterans' organizations have been chiefly patriotic and social in purpose. They try to develop the comradeships formed during war, and to support the laws and government of the nation. They also provide care

for the widows and children of deceased veterans. Veterans' organizations conduct memorial services, and take care of the graves of deceased veterans.

These groups usually have great political influence because of their large membership. The groups use this power to obtain legislation that will benefit veterans, such as pensions, education, and care for disabled veterans.

In the United States, the Society of the Cincinnati was the first veterans' organization. Major General Henry Knox suggested that officers of the continental army should organize a society of veterans who fought in the Revolutionary War. The Society of the Cincinnati began operating in 1783, with George Washington as its first president.

The veterans' organizations formed after the War of 1812 and the Mexican War were not large. After the Civil War, with its large armies, powerful veterans organizations came into existence. The Grand Army of the Republic (GAR), an organization of veterans of the Union Army, began its work in 1866. It had enough influence to control the Republican party for almost 40 years. It reached its highest membership in 1890. The support of the GAR often meant the difference between victory and defeat for candidates in the North. The United Confederate Veterans held a similar position in the South.

Attempts to organize the veterans of foreign military campaigns began in the late 1890's. The United Spanish War Veterans, founded in 1898, included men who fought in the Spanish-American War. Three groups of veterans of foreign wars joined together in 1913 to form the Veterans of Foreign Wars. In 1919, following World War I, men who fought in France formed a veterans' organization called the *American Legion*. The Disabled American Veterans was established in 1920.

After World War II, veterans formed new organizations. The American Veterans of World War II, Korea, and Vietnam (AMVETS) was founded in 1944. It has a membership of about 250,000. The American Veterans Committee (AVC) began in 1944. Its membership is about 25,000.

In Canada, the 240,000-member Canadian Legion is the country's largest veterans' organization. It was founded in 1925, and has about 2,000 branches in Canada. The Army, Navy, and Air Force Veterans in Canada is the country's oldest veterans' group. It was founded in 1837, and ranks second in size. Other Canadian veterans' organizations include the Canadian Corps Association, Canadian Paraplegic Association, Canadian Pensioners Association of the Great War, and the War Amputations of Canada. H. J. GUINIVAN, JR.

Related Articles in WORLD BOOK include:

American Legion
American Legion Auxiliary
Amvets
Confederate Veterans, United
Disabled American Veterans
Grand Army of the Republic
Spanish War Veterans, United
Veterans Day
Veterans of Foreign Wars of the United States

VETERANS' READJUSTMENT ACTS. See VETERANS ADMINISTRATION (Benefits and Other Services); GI BILL OF RIGHTS.

A.V.M.A.

VETERINARY MEDICINE, *VEHT uhr uh* NEHR *ee*, is the branch of medicine that deals with the diseases of animals. An animal doctor is called a *veterinarian*. His work is especially valuable because many animal diseases can be transmitted to human beings. Such diseases are called *zoonoses*. Examples of these are rabies, brucellosis, tuberculosis, parrot fever (psittacosis), and rabbit fever (tularemia).

Treating pets is one of the most profitable fields in veterinary medicine. The veterinarian plays an important role in the control of rabies. The proper vaccination of dogs against rabies and the diagnosis of the disease are part of his duties.

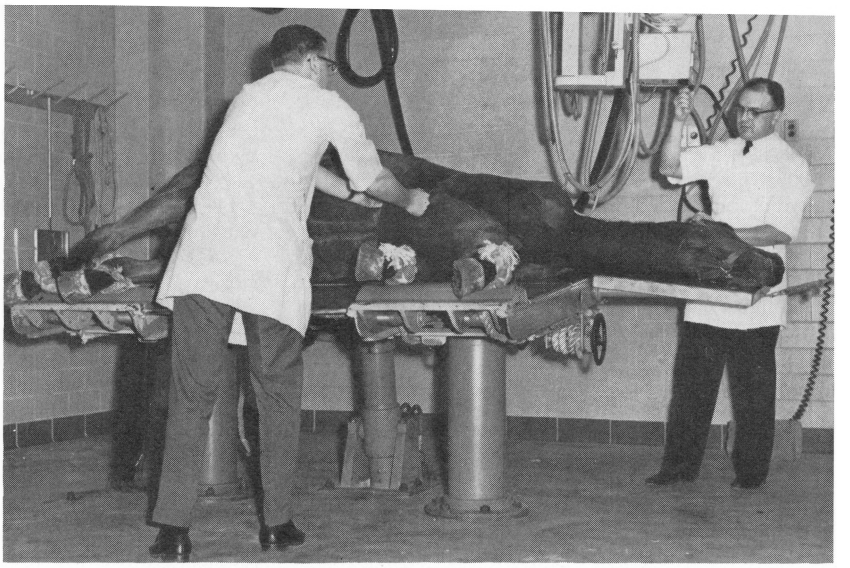
In Cities, most veterinarians are associated with pet hospitals. Many animal hospitals contain equipment much like that used in hospitals for human beings. There, animals may be cared for during illnesses, and surgery may be performed if necessary.

Many veterinarians also are associated with the public health services of cities, states, or the federal government. In this service, their special skills and knowledge are helpful in controlling animal-borne diseases. They

A Veterinarian, *left,* treats animals to keep them healthy, just as a physician treats human beings. Dogs and other animals live longer, happier lives with good medical care.

A Tilting Table, *right,* helps veterinarians take care of large animals such as horses and cows. Here, two veterinarians prepare to take X-ray pictures of a horse's head.

Twin Calves, *below,* are used in a veterinary research project. Veterinarians make openings into the calves' stomachs to study how the calves digest various kinds of food.



Dept. of Veterinary Clinics, School of Veterinary Science and Medicine, Purdue University

Kansas State University

may inspect meat and meat products, or direct some of the operations in slaughtering and packing houses. They may work in laboratories testing milk or other dairy products, or preparing serums and vaccines.

On Farms. Perhaps the most important activity of the veterinarian is the care and treatment of livestock. Veterinarians keep farm animals in good condition, to prevent outbreaks of animal diseases. Epidemics of animal diseases, called *epizootics*, may be very dangerous, not only to the animals but to human beings as well.

Veterinarians have played an important part in controlling bovine tuberculosis, a form of tuberculosis that can be passed from cows to human beings. In 1917, the federal government began a program to wipe out this disease. A cooperative plan set up by the federal and state governments allows veterinarians to test dairy cattle for tuberculosis. Another project works to control and eradicate bovine brucellosis. This disease also can be transferred to human beings (see BANG'S DISEASE).

Veterinarians give many kinds of inoculations to protect farm animals against disease. For example, they inoculate young pigs against hog cholera. At one time, this dread disease often swept from farm to farm, killing all the hogs in an entire farming community.

Other Services. Circuses and zoos constantly require the services of veterinarians to keep their animals healthy. Veterinarians may also be employed in government service, where they often specialize in the study and treatment of wildlife.

Careers in Veterinary Medicine. Persons who want to become veterinarians must have at least two years of preveterinary college work, followed by four years of study in a college of veterinary medicine. However, many students complete three or four years of preveterinary study. During the four years of veterinary school, they study such subjects as anatomy, surgery, chemistry, physiology, and the breeding and feeding of animals.

There are 18 veterinary colleges in the United States and 3 in Canada that are accredited by the American Veterinary Medical Association. These schools offer courses of study that lead to the degree of Doctor of Veterinary Medicine (D.V.M.). After earning a diploma, the graduate must comply with the license laws of

his state before he is allowed to practice his profession.

After he is licensed, the veterinarian may go into private practice. He may join the veterinary services of the government or the armed forces. If he is interested in research, he may want to work with the U.S. Public Health Service, the U.S. Department of Agriculture, an agricultural experiment station, or a veterinary college. Veterinarians often work in commercial laboratories that produce serums and vaccines.

The American Veterinary Medical Association serves to maintain the professional standards of veterinary medicine. Local and state groups send representatives to its annual meetings. Headquarters are at 600 S. Michigan Avenue, Chicago, Ill. 60605. D. W. Bruner

VETO, *VEE toh,* is a Latin word which means *I forbid.* In American government, the word *veto* usually refers to the President's power to kill a law that the legislative branch has already passed.

The President of the United States has a *limited* veto power. It is not absolute. A vote of a two-thirds majority of the members present in both houses of Congress can override it. The sovereign of Great Britain still holds the power of *absolute* veto. But no British king or queen has used this power since 1707.

When the two houses of Congress pass a bill or joint resolution, it is presented to the President of the United States. Then one of four things must happen:

The President may approve the bill. If so, he signs it and it becomes law.

The President may allow the bill to become law without his signature. This can take place under the clause in the Constitution which provides that "if any bill shall not be returned by the President within 10 days (Sundays excepted) after it shall have been presented to him, the same shall be a law in like manner as if he had signed it, unless the Congress by their adjournment prevent its return, in which case it shall not be a law."

The President may retain the bill, in the expectation that Congress will adjourn within 10 days and thus the bill will be defeated. This method is called the *pocket veto.* It is used by Presidents who find certain bills unsatisfactory but do not want to veto them openly. Vetoing a congressional bill defeats all parts of it. All provisions and "riders" attached to the bill are vetoed with it.

The President may veto the bill. If he does, he must send a message to Congress stating his reasons.

Presidents' Use of the Veto. When the Constitution was adopted, Alexander Hamilton declared that Presidents would use the veto power with great caution. Seven Presidents did not veto any bills. Franklin D. Roosevelt, who served as President longer than any other person, vetoed the most bills. Roosevelt used 372 regular vetoes and 263 pocket vetoes. Grover Cleveland ranks second, with 346 regular and 238 pocket vetoes. Congress has overridden only about 5 per cent of all presidential vetoes. For example, 11 of the Presidents who vetoed bills had no vetoes overridden by Congress. Congress reversed only 9 of Roosevelt's 372 regular vetoes and only 2 of the 73 issued by Dwight D. Eisenhower. But it overrode 15 of Andrew Johnson's 21 regular vetoes.

Governors' Veto Power. Most state governors also have a veto power. But in some states, the governor's veto may be overridden by a simple majority of the members present in the houses of the legislature, rather than by a required two-thirds majority. Most governors can veto parts of appropriation bills. Payson S. Wild

See also United Nations (Voting); United States, Government of (diagram: How A Bill Becomes Law).

VETTISFOSS, *VET is FAWS,* is a waterfall in western Norway. It ranks as one of the country's highest waterfalls. Vettisfoss measures 889 feet (271 meters) in height. Many tourists visit the area.

VEVAY, *VEEvay,* Ind. (pop. 1,463), lies on the Ohio River across from Kentucky. Vevay is the county seat of Switzerland County and the center of a fertile farming region. Its most important products are tobacco and milk. The city is about 90 miles (140 kilometers) southeast of Indianapolis (see Indiana [political map]). Some Swiss colonists settled on the site of Vevay in 1801. In the early years, the Swiss settlers planted vineyards and produced a wine which became famous throughout the Middle West. Paul E. Million, Jr.

VEXILLOLOGY. See Flag (introduction; table: Flag Terms).

VFW. See Veterans of Foreign Wars of the United States.

VHF WAVE. See Very High Frequency Wave.

VIA APPIA or Appian Way. See Appian Way.

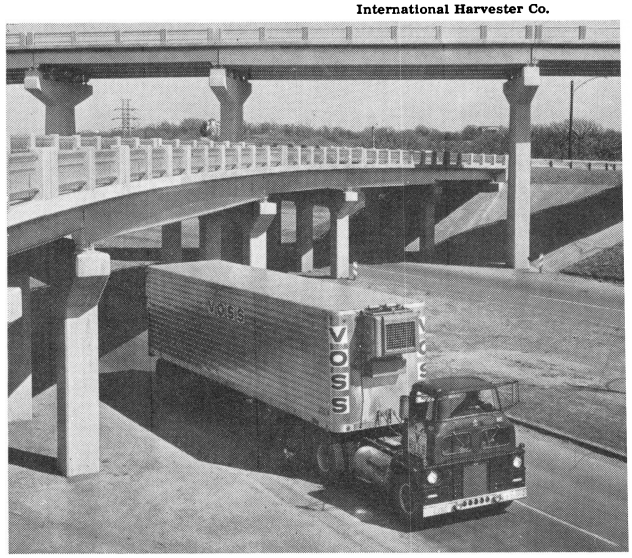
VIA FLAMINIA. See Flaminian Way.

VIA SACRA. See Rome (Forums).

VIA SALARIA. See Salt (History).

VIADUCT, *VI uh dukt,* is like a bridge, except that it crosses over dry land instead of water. Some viaducts do cross water, but they also cross dry land instead of merely extending from bank to bank as a bridge does. Most viaducts consist of a series of supports under beam-and-slab or arch construction. Viaducts carry railroad tracks over valleys and gorges. Some viaducts are built higher than the general level of the land to carry railroads over highways or to make a safe crossing for highways over railroads. The ancient Romans built the first viaducts. The aqueducts they built to carry water to cities often also served as roadways.

Viaducts Help Make the Flow of Traffic Safe and Easy.
International Harvester Co.



One of the longest viaducts ever built was a portion of the 110-mile (177-kilometer) Key West extension of the Florida East Coast Railway. Viaducts that extended over the open sea formed 30 miles (48 kilometers) of this extension. Parts were destroyed by a hurricane in 1935, but these were rebuilt as a highway a few years later. The main part of the pier viaduct over the mouth of the River Tay in Scotland has 84 steel spans and is over 2 miles (3.2 kilometers) long. The Tunkhannock viaduct on the Lackawanna Railway is one of the largest steel and concrete viaducts in the world. It is 2,375 feet (724 meters) long and includes 10 spans of 180 feet (55 meters) each. Another famous viaduct is the $3\frac{1}{2}$-mile (5.6-kilometer) Pulaski Skyway between Newark and Jersey City. Other well-known viaducts are the Pecos River viaduct in Texas and the Landwasser viaduct across the Albula Pass, in the canton of Graubünden, Switzerland. ROBERT G. HENNES

VIATICUM, *vy AT ih kum*, in the Catholic Church, is the last communion, or Holy Eucharist, administered to the dying or those in danger of death. During a long illness it may be given several times. It is given before Anointing of the Sick. In Latin, the word means *provision for a journey*. In the early Christian Church, it was applied to anything that gave spiritual comfort to the dying. See also ANOINTING OF THE SICK. FULTON J. SHEEN

VIBRATION, in mechanics, indicates to-and-fro motion, or *oscillation*, of a particle. The two types of vibration are *natural* and *artificial*. An earthquake causes a natural vibration. But most vibrations are artificial, because some man-made device causes them. For example, engineers design special devices called *vibrators* that cause vibration or shaking. Foundries use a special vibrator to loosen a mold that has been placed in sand. Vibrators are also used in medicine to stimulate the circulation and the muscles. If objects did not vibrate, it would be impossible to speak to anyone, because all sound begins with a vibrating object. When a person speaks, his vocal cords begin the vibrations.

Aside from a relatively few valuable uses, vibration is undesirable in industry and in most daily living. It may cause weakening of structures and produce wear and inefficiency. In cities, trucks, subways, elevated trains, and other traffic cause much vibration. These vibrations sometimes enter the steel structure of a large building, and can be felt throughout the building. Engineers deal with this problem by using special materials that absorb vibration. Pneumatic tires are used in an effort to reduce the vibrations on moving automobiles. Automobile engines are mounted on rubber supports to reduce vibration as much as possible. Vibration dampers have also been designed in crankshafts.

Many industries must deal with the problem of vibration and its effect on machinery. Rotating parts of machines give trouble from vibration unless they are accurately balanced, especially at high speeds. The supports of such rotating parts were once bolted to the machine frame or its foundation. To reduce the effect of vibration in machines, the supports for high-speed rotating parts are now sometimes mounted on springs, rubber, or some other kind of flexible connection.

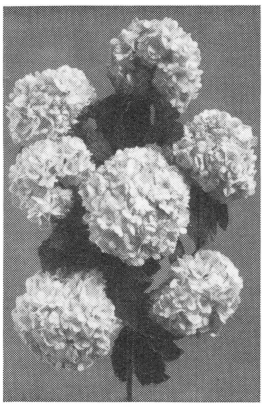
Mechanical vibrations have various frequencies and amplitudes. *Frequency* is the number of complete vibrations during a certain time. *Amplitude* is the maximum distance the particle travels from its normal position of *equilibrium*, or rest. ROBERT L. WEBER

See also SOUND; WAVES.

VIBURNUM is the name for a group of shrubs and small trees of the honeysuckle family. These plants grow in large numbers throughout North America, Europe, and Asia. They have white or pink flowers, and leaves which sometimes turn various colors in the autumn. Gardeners like viburnum shrubs for borders.

Scientific Classification. The viburnum belongs to the honeysuckle family, *Caprifoliaceae*. Some of the common American kinds are genus *Viburnum*, species *V. acerifolium*, *V. alnifolium*, and *V. trilobum*. ALFRED C. HOTTES

See also HONEYSUCKLE.



J. Horace McFarland

Flowers of the Viburnum make it one of the most attractive shrubs used to ornament gardens. The plant produces berries that are coral red, later purple. Bees are likely to be seen hovering about them.

VICAR, *VICK ur*, is a person who represents and performs duties for a higher official in a church. The term comes from the Latin word *vicarius*, meaning a *substitute*. The pope of the Roman Catholic Church is called the Vicar of Christ on earth. *Vicars apostolic* are bishops who serve as personal representatives of the pope in mission areas. A *vicar general* acts as the deputy of a bishop, and a *vicar capitular* administers a diocese in the absence of a bishop. The Church of England uses the title of vicar for the head of a parish who, for some reason, may not be called the rector. In the Episcopal Church of the United States, the term usually refers to the priest in charge of a parish chapel. R. PIERCE BEAVER and FULTON J. SHEEN

VICAR OF WAKEFIELD. See GOLDSMITH, OLIVER.

VICE-ADMIRAL. See RANK IN ARMED SERVICES.

VICE-PRESIDENT is the second highest executive in the government of some countries. In Brazil, under the constitution, he is popularly elected for a five-year term, serves as president of the senate, and cannot serve two terms in a row. In Bolivia, the vice-president assumes the presidency in the event of the president's death or failure to assume the office. The vice-president of Argentina presides over the senate, but has no other political power. In Chile, there is no permanent vice-president. But when the president is ill or leaves the country, he can appoint a temporary vice-president. In some Communist nations of eastern Europe, vice-presidents are heads of ministries or hold honorary titles without administrative duties. IRVING G. WILLIAMS

See also VICE-PRESIDENT OF THE UNITED STATES.

VICE-PRESIDENT OF THE UNITED STATES

Coat of Arms of the Vice-President

VICE-PRESIDENT OF THE UNITED STATES is only a heartbeat away from the most powerful elective office in the world. He must be ready to become President or acting President at a moment's notice if the President dies, resigns, is removed from office, or becomes unable to perform his duties.

Thirteen Vice-Presidents have become President, eight because of the death of a President. These eight so-called "accidental Presidents" were John Tyler, Millard Fillmore, Andrew Johnson, Chester A. Arthur, Theodore Roosevelt, Calvin Coolidge, Harry S. Truman, and Lyndon B. Johnson. The other Vice-Presidents who became President were John Adams, Thomas Jefferson, Martin Van Buren, Richard M. Nixon, and Gerald R. Ford. Ford was the only one to take office because of a President's resignation.

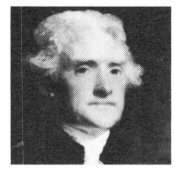
The United States Constitution also provides that the Vice-President shall become acting President if the

Irving G. Williams, the contributor of this article, is Professor of History at St. John's University, and author of Government: Its Structure and Interpretation.

PORTRAIT GALLERY OF THE VICE-PRESIDENTS

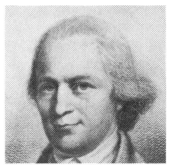
The term of each Vice-President, as well as the name of the President under whom he served, is listed under each picture. The asterisks identify those Vice-Presidents who later served as President of the United States.

*John Adams
1789-1797
Washington



*Thomas Jefferson
1797-1801
J. Adams

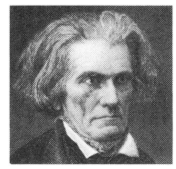
Aaron Burr
1801-1805
Jefferson



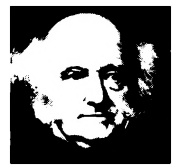
George Clinton
1805-1812
Jefferson-Madison

Elbridge Gerry
1813-1814
Madison

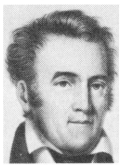
Daniel D. Tompkins
1817-1825
Monroe



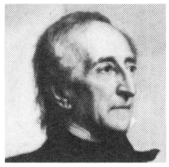
John C. Calhoun
1825-1832
J. Q. Adams-Jackson



*Martin Van Buren
1833-1837
Jackson



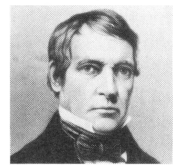
Richard M. Johnson
1837-1841
Van Buren



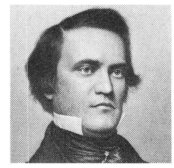
*John Tyler
1841
W. H. Harrison

George M. Dallas
1845-1849
Polk

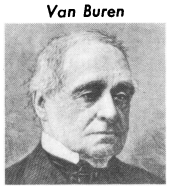
*Millard Fillmore
1849-1850
Taylor



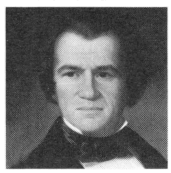
William R. D. King
1853
Pierce



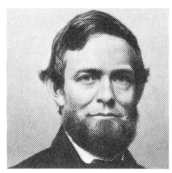
John C. Breckinridge
1857-1861
Buchanan



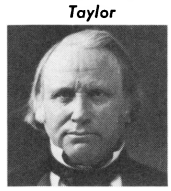
Hannibal Hamlin
1861-1865
Lincoln



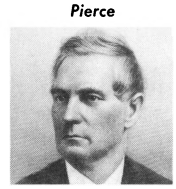
*Andrew Johnson
1865
Lincoln



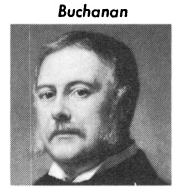
Schuyler Colfax
1869-1873
Grant



Henry Wilson
1873-1875
Grant



William A. Wheeler
1877-1881
Hayes



*Chester A. Arthur
1881
Garfield

President is disabled. In 1967, the 25th Amendment to the Constitution was ratified. It spelled out procedures in case of presidential disability and provided for vice-presidential succession (see CONSTITUTION OF THE UNITED STATES [Amendment 25]). Presidents James A. Garfield, Woodrow Wilson, and Dwight D. Eisenhower all had serious illnesses. But their Vice-Presidents carefully avoided assuming the duties of the President.

The Vice-President serves as the presiding officer of the United States Senate, and has the title of *president of the Senate*. The Constitution gives him no other official duty. For more than a hundred years the absence of political importance of the job caused it to be treated as somewhat of a joke. Some persons have humorously suggested that the Vice-President be addressed as "His Superfluous Excellency."

Yet the Founding Fathers had high hopes for the vice-presidency. James Iredell of North Carolina, a delegate to the Constitutional Convention of 1787, explained that there would be "two men . . . in office at the same time; the President, who will possess, in the highest degree, the confidence of the country, and the

FACTS IN BRIEF ABOUT THE VICE-PRESIDENT

Qualifications: The United States Constitution provides that a candidate must be a "natural-born" U.S. citizen and must have lived in the United States for at least 14 years. He must be at least 35 years old. No law or court decision has yet defined the exact meaning of the term *natural-born*. Authorities assume that the term applies to all citizens born in the United States and its territories. But they are not certain if the term also includes children born to U.S. citizens in other countries.

How Nominated: By a national political convention. If a vacancy in the vice-presidency exists, the President nominates a new Vice-President, who takes office upon confirmation by a majority vote of both houses of Congress.

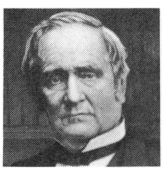
How Elected: By a majority vote of the Electoral College, held in December following the general election held on the first Tuesday after the first Monday in November of every fourth year.

Inauguration: Held at noon, January 20, after election by the Electoral College. If the date falls on Sunday, the ceremony is held on Monday, January 21.

Term: The Vice-President is elected for four years, and can serve any number of terms.

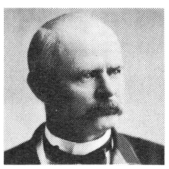
Income: $62,500 annual salary, $10,000 expense allowance, and about $365,000 allowance for clerical assistance.

Removal from Office: Impeachment by a majority vote of the House of Representatives, and trial and conviction by a two-thirds vote of those present in the Senate.



Thomas A. Hendricks
1885
Cleveland

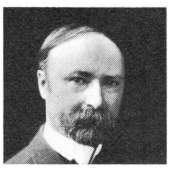
Levi P. Morton
1889-1893
B. Harrison



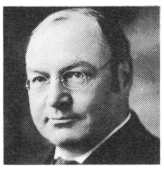
Adlai E. Stevenson
1893-1897
Cleveland

Garret A. Hobart
1897-1899
McKinley

*Theodore Roosevelt
1901
McKinley



Charles W. Fairbanks
1905-1909
T. Roosevelt



James S. Sherman
1909-1912
Taft

Thomas R. Marshall
1913-1921
Wilson

*Calvin Coolidge
1921-1923
Harding

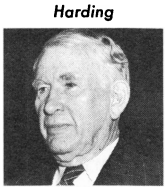
Charles G. Dawes
1925-1929
Coolidge

Charles Curtis
1929-1933
Hoover

John N. Garner
1933-1941
F. Roosevelt

Henry A. Wallace
1941-1945
F. Roosevelt

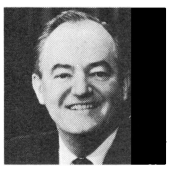
*Harry S. Truman
1945
F. Roosevelt



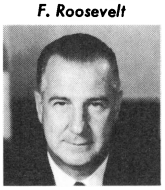
Alben W. Barkley
1949-1953
Truman

*Richard M. Nixon
1953-1961
Eisenhower

*Lyndon B. Johnson
1961-1963
Kennedy



Hubert H. Humphrey
1965-1969
Johnson



Spiro T. Agnew
1969-1973
Nixon

*Gerald R. Ford
1973-1974
Nixon

Nelson A. Rockefeller
1974-
Ford

National Gallery of Art, Washington, D.C., gift of Mrs. Robert Homans; Bowdoin College Museum of Art, Brunswick, Me.; New-York Historical Society, New York City; Brown Brothers; Chicago Historical Society; Library of Congress; Culver; George Peter Alexander Healy in the collection of the Corcoran Gallery of Art; Culver; White House; Brown Brothers; George Peter Alexander Healy in the collection of the Corcoran Gallery of Art; Brown Brothers; Culver; Historical Pictures Service; Tennessee Historical Society; Culver; Library of Congress; Brown Brothers; George Peter Alexander Healy in the collection of the Corcoran Gallery of Art; Hanover College; Culver; Chicago Historical Society; Library of Congress; Chicago Historical Society; Culver; Library of Congress; Chicago Historical Society; New-York Historical Society, New York City; Harris and Ewing; Ewing Galloway; United Press Int.; Brown Brothers; Harris and Ewing; Wide World; Nixon; Karsh, Ottawa; Harris and Ewing; Office of the Vice-President; *Chicago Daily News;* Wide World.

Vice-President, who is thought to be the next person in the Union most fit to perform this trust."

The prestige of the vice-presidency has gradually increased since the early 1920's. Beginning in 1933 with the presidency of Franklin D. Roosevelt, Vice-Presidents have regularly attended meetings of the President's Cabinet. Dwight D. Eisenhower and John F. Kennedy did more than any other Presidents to establish the importance of the office of Vice-President. Eisenhower's Vice-President, Richard M. Nixon, and Kennedy's Vice-President, Lyndon B. Johnson, had important duties and responsibilities. When Kennedy was assassinated in 1963, many experts believed that Johnson was the best-prepared "accidental President."

The Vice-President has offices in the Capitol, the Richard B. Russell Office Building of the U.S. Senate, and Executive Office Building. All these are in Washington, D.C. In 1974, Congress established a 33-room mansion on the grounds of Washington's Naval Observatory as the Vice-President's official residence. Secret service agents guard the Vice-President.

Choosing a Vice-President

Nomination of the vice-presidential candidate usually comes as an anticlimax to a political convention. The excitement of selecting the presidential nominee is over, but the delegates must still choose his *running mate*. The delegates usually nominate the presidential nominee's preference. A contest develops only if the presidential nominee makes no choice.

Many factors may influence the selection of a vice-presidential nominee. After a bitter convention, the winning presidential nominee may support a candidate who can help restore party harmony. His choice for Vice-President may be one of the losing candidates for the presidency, or a supporter of one of the losers. In 1844, the Democrats nominated Senator Silas Wright of New York for Vice-President. They did this to appease former President Martin Van Buren, who had failed to win the Democratic presidential nomination. But Wright, a close friend of Van Buren, declined the selection. In 1972, the Democratic vice-presidential nominee, Senator Thomas F. Eagleton, became the only man ever to withdraw after having accepted his party's nomination at a national convention. He did so following the disclosure that he had received psychiatric treatment. See EAGLETON, THOMAS F.

Often the Vice-President comes from one of the states considered to be especially important in the election. This may be a state in which the election outcome is expected to be very close, or it may simply be a state with a large electoral vote. By appealing to local loyalties, the vice-presidential candidate may strengthen his party's vote in his "home" state.

Sometimes the vice-presidency has been "traded" by a presidential candidate for help in winning the nomination. For example, an influential governor or U.S. Senator may be promised the vice-presidential nomination in return for swinging his state's delegates to a certain presidential candidate.

The vice-presidential choice often is made to *balance the ticket*. If an older man is nominated for President, a younger man may be chosen for Vice-President. A presidential nominee from the East may be balanced with a vice-presidential nominee from the West. If the presidential nominee is known as a conservative, the vice-presidential nominee may be a liberal. By balancing the ticket, party leaders hope to win the support of the largest possible number of voters.

The system of selecting a Vice-President helps the party win the election. It does not necessarily produce the man best qualified to serve as Vice-President. The custom of balancing the ticket with men of conflicting political beliefs has often been criticized. Theodore Roosevelt said early in his political career: "It is an unhealthy thing to have a Vice-President and President represented by principles so far apart that the succession of one to the place of the other means a change as radical as any party overturn." This occurred when John Tyler succeeded William Henry Harrison. And, ironically, it also happened when Roosevelt later succeeded William McKinley.

The Campaign. The vice-presidential candidate plays an active role in the election campaign. He and the presidential candidate usually map out separate campaign routes for maximum coverage of the country. They may later change places to cover all strategic areas with repeated campaigning.

Election. Voters select the same electors for the Vice-President when they choose presidential electors. They cannot split the ticket. That is, a person cannot vote for electors of the presidential candidate of the Republican party and for electors of the vice-presidential candidate of the Democratic party. He must vote for a slate of electors pledged to one party's candidates.

The Electoral College elects the President and Vice-President on separate ballots (see ELECTORAL COLLEGE). If the Electoral College fails to choose the Vice-President by a majority vote, the U.S. Senate elects him from among the two leading candidates. At least two-thirds of the Senate must be present at the voting, and the winner must receive a majority vote of the entire membership.

The Senate has elected a Vice-President only once. In 1837, the Senate elected Richard M. Johnson, a Democrat, by a vote of 33 to 16 over Francis Granger, a Whig. Johnson had fallen one vote short in the Electoral College. He became such a politically controversial figure that the Democrats refused to renominate him in 1840. In fact, they failed to nominate any vice-presidential candidate—the only time any convention has done so.

Inauguration. Until 1933, the Vice-President took his oath of office in the Senate. Today, both President and Vice-President are inaugurated in the same ceremony in January following their election. The Vice-President is sworn into office immediately before the President is inaugurated. The Vice-President's oath of office may be administered by the retiring Vice-President, by a member of Congress, or by some other government official, such as a justice of the Supreme Court of the United States.

In the early days, the Vice-President made an inaugural address. This custom has disappeared with the adoption of the combined ceremony in which the President gives the inaugural address.

The 25th Amendment spells out procedures for filling a vacancy in the vice-presidency. The office becomes

THE VICE-PRESIDENTS OF THE UNITED STATES

Name	Birthplace	Occupation or Profession	Political Party	Age at Inauguration	Term	President
1. **Adams, John (a)**	Braintree, Mass.	Lawyer	Federalist	53	1789-1797	Washington
2. **Jefferson, Thomas (a)**	Albemarle County, Va.	Planter	Democratic-Republican	53	1797-1801	J. Adams
3. **Burr, Aaron**	Newark, N.J.	Lawyer	Democratic-Republican	45	1801-1805	Jefferson
4. **Clinton, George (c)**	Little Britain, N.Y.	Soldier	Democratic-Republican	65 69	1805-1809 1809-1812	Jefferson Madison
5. **Gerry, Elbridge (c)**	Marblehead, Mass.	Businessman	Democratic-Republican	68	1813-1814	Madison
6. **Tompkins, Daniel D.**	Fox Meadows, N.Y.	Lawyer	Democratic-Republican	42	1817-1825	Monroe
7. **Calhoun, John C. (d)**	Abbeville District, S.C.	Lawyer	Democratic-Republican Democrat	42 46	1825-1829 1829-1832	J. Q. Adams Jackson
8. **Van Buren, Martin (a)**	Kinderhook, N.Y.	Lawyer	Democrat	50	1833-1837	Jackson
9. **Johnson, Richard M.**	Beargrass, Ky.	Lawyer	Democrat	56	1837-1841	Van Buren
10. **Tyler, John (b)**	Charles City County, Va.	Lawyer	Whig	50	1841	W. H. Harrison
11. **Dallas, George M.**	Philadelphia, Pa.	Lawyer	Democrat	52	1845-1849	Polk
12. **Fillmore, Millard (b)**	Locke, N.Y.	Lawyer	Whig	49	1849-1850	Taylor
13. **King, William R. D. (c)**	Sampson County, N.C.	Lawyer	Democrat	66	1853	Pierce
14. **Breckinridge, John C.**	near Lexington, Ky.	Lawyer	Democrat	36	1857-1861	Buchanan
15. **Hamlin, Hannibal**	Paris, Me.	Lawyer	Republican	51	1861-1865	Lincoln
16. **Johnson, Andrew (b)**	Raleigh, N.C.	Tailor	National Union (e)	56	1865	Lincoln
17. **Colfax, Schuyler**	New York, N.Y.	Auditor	Republican	45	1869-1873	Grant
18. **Wilson, Henry (c)**	Farmington, N.H.	Businessman	Republican	61	1873-1875	Grant
19. **Wheeler, William A.**	Malone, N.Y.	Lawyer	Republican	57	1877-1881	Hayes
20. **Arthur, Chester A. (b)**	Fairfield, Vt.	Lawyer	Republican	51	1881	Garfield
21. **Hendricks, Thomas A. (c)**	near Zanesville, O.	Lawyer	Democrat	65	1885	Cleveland
22. **Morton, Levi P.**	Shoreham, Vt.	Banker	Republican	64	1889-1893	B. Harrison
23. **Stevenson, Adlai E.**	Christian County, Ky.	Lawyer	Democrat	57	1893-1897	Cleveland
24. **Hobart, Garret A. (c)**	Long Branch, N.J.	Lawyer	Republican	52	1897-1899	McKinley
25. **Roosevelt, Theodore (b) (a)**	New York, N.Y.	Author	Republican	42	1901	McKinley
26. **Fairbanks, Charles W.**	near Unionville Center, O.	Lawyer	Republican	52	1905-1909	T. Roosevelt
27. **Sherman, James S. (c)**	Utica, N.Y.	Lawyer	Republican	53	1909-1912	Taft
28. **Marshall, Thomas R.**	North Manchester, Ind.	Lawyer	Democrat	58	1913-1921	Wilson
29. **Coolidge, Calvin (b) (a)**	Plymouth Notch, Vt.	Lawyer	Republican	48	1921-1923	Harding
30. **Dawes, Charles G.**	Marietta, O.	Lawyer	Republican	59	1925-1929	Coolidge
31. **Curtis, Charles**	Topeka, Kans.	Lawyer	Republican	69	1929-1933	Hoover
32. **Garner, John N.**	Red River County, Tex.	Lawyer	Democrat	64	1933-1941	F. Roosevelt
33. **Wallace, Henry A.**	Adair County, Ia.	Farmer	Democrat	52	1941-1945	F. Roosevelt
34. **Truman, Harry S. (b) (a)**	Lamar, Mo.	Businessman	Democrat	60	1945	F. Roosevelt
35. **Barkley, Alben W.**	Graves County, Ky.	Lawyer	Democrat	71	1949-1953	Truman
36. **Nixon, Richard M. (a)**	Yorba Linda, Calif.	Lawyer	Republican	40	1953-1961	Eisenhower
37. **Johnson, Lyndon B. (b) (a)**	near Stonewall, Tex.	Teacher	Democrat	52	1961-1963	Kennedy
38. **Humphrey, Hubert H.**	Wallace, S.Dak.	Pharmacist	Democrat	53	1965-1969	Johnson
39. **Agnew, Spiro T. (d)**	Towson, Md.	Lawyer	Republican	50	1969-1973	Nixon
40. **Ford, Gerald R. (f) (g)**	Omaha, Nebr.	Lawyer	Republican	60	1973-1974	Nixon
41. **Rockefeller, Nelson A. (f)**	Bar Harbor, Me.	Businessman	Republican	66	1974-	Ford

(a) Elected to the presidency. (b) Succeeded to the presidency upon the death of the President. (c) Died in office. (d) Resigned. (e) The National Union party consisted of Republicans and War Democrats. Johnson was a Democrat. (f) Became Vice-President by filling a vacancy. (g) Succeeded to the presidency upon the resignation of the President.
Each Vice-President has a separate biography in WORLD BOOK.

vacant if the Vice-President dies, resigns, or is unable to carry out his duties. Then the President appoints a new Vice-President. His appointment is subject to the approval of a majority of both houses of Congress. In 1973, House Minority Leader Gerald R. Ford became the first Vice-President chosen under terms of the 25th Amendment. He succeeded Vice-President Spiro T. Agnew, who resigned. See FORD, GERALD R.

Roles of the Vice-President

The Vice-President can be only as important as the President chooses to let him be. He has almost no political power, unless the President chooses to consult him about matters concerning party policy and political appointments. Even the Vice-President's role as a Cabinet member depends on the wishes of the President.

With the active support of the President, the Vice-President can exert tremendous influence. His attendance at conferences between the President and congressional leaders strengthens his own power with the legislative branch. If the President gives him important diplomatic missions, the Vice-President can help shape the foreign policy of the United States.

A Typical Day for the Vice-President might begin with a breakfast conference called by the President. Perhaps a legislative meeting follows. The two men confer with their party's congressional leaders about legislation being debated by the Senate and the House

of Representatives. The Vice-President may then go to his office in the Senate wing of the Capitol. He reads and answers his mail, and sees callers who have appointments. Tourists or unexpected visitors on emergency matters also may arrive. If the Senate is meeting that day, the Vice-President enters about noon to preside at the opening of the session. He may remain at the session, depending on the nature of the day's business and his own schedule. If he leaves, the president *pro tempore* or another senator takes over his duties.

The Vice-President spends many evenings away from his home. He must make various kinds of public appearances, many of which require him to make speeches. He may go to the airport to greet dignitaries from other nations. His ceremonial duties may require him to dedicate a public-works project, open an athletic tournament, or present an award to a contest-winner.

President of the Senate. When presiding over the Senate, the Vice-President performs the duties of chairman. He cannot take part in any Senate debates. Nor can he vote, except in the rare case of a tie. John Adams cast a deciding vote 29 times, more than did any other Vice-President.

The Vice-President enforces the rules established by the Senate for its own guidance. Senators can speak only after being recognized by the Vice-President or the president *pro tempore*. By using this power of recognition, the Vice-President can either aid or hold back legislation by permitting only certain senators to speak. He also has the power to make rulings in disputes over procedure by interpreting the rules of the Senate. But the Senate can overrule his decisions by a majority vote. In 1919, Vice-President Thomas R. Marshall ruled three times in one day on a certain point. He was fighting to save the controversial Versailles Treaty and United States membership in the League of Nations. The Senate overruled Marshall three times and finally defeated the treaty.

The president of the Senate also directs the counting of electoral votes for President and Vice-President. Early Vice-Presidents could decide whether to count or disallow disputed votes. Congress has since assumed this power, leaving the Vice-President only formally in charge of counting electoral votes.

Administration and Policy-Making. The Vice-President attends meetings of the President's Cabinet. He serves as vice-chairman of the Domestic Council. He is a member of the National Security Council, the highest advisory body to the President on matters of foreign and defense policies. The Vice-President also is a member of the Board of Regents of the Smithsonian Institution. See CABINET; NATIONAL SECURITY COUNCIL; SMITHSONIAN INSTITUTION.

The President may assign the Vice-President general counseling and liaison activities. Such duties may involve trips abroad to spread good will, exchange information, and learn about the attitudes of various nations toward the United States. He may also act as an intermediary between the President and his political party, both in Congress and the party. He attempts to build party support for the President's program.

Social Duties. One of the oldest functions of the Vice-President is to serve as ceremonial assistant to the President. For example, he attends many receptions and other social events at which the President cannot be present. The Vice-President often plays host to dignitaries from other countries.

Some Vice-Presidents have enjoyed their ceremonial and social duties, but others have not. Calvin Coolidge took a typically characteristic and philosophic approach. When his hostess at a dinner once remarked to him how annoying it must be to have to dine out so often, Coolidge replied: "Have to eat somewhere." John Nance Garner drew the line on social life. He went to bed early and refused to receive calls from 6 P.M. to 7 A.M., saying these hours "are my own."

History of the Vice-Presidency

Early Days. Most historians believe that Alexander Hamilton first proposed the office of Vice-President. Not all the delegates to the Constitutional Convention supported the idea. But on Sept. 6, 1787, the convention approved his proposal. The Founding Fathers originally provided that the man who received the second highest electoral vote for President should become Vice-President. Each elector had two votes,

INTERESTING FACTS ABOUT THE VICE-PRESIDENTS

Who was the youngest Vice-President to be inaugurated? Breckinridge, 36. **The oldest?** Barkley, 71.

Which Vice-Presidents were chosen under provisions of the 25th Amendment? Ford, Rockefeller.

Who was the first Vice-President to attend meetings of the Cabinet regularly? Coolidge.

Who was the first Vice-President to become a regular member of the National Security Council? Barkley.

What Vice-President presided over the Senate with a brace of pistols beside him? Van Buren.

Who was the only Vice-President, since 1804, to be elected President while holding office as Vice-President? Van Buren.

What Vice-President-elect was so ill that he died without ever performing the duties of his office? King.

Who was the first Vice-President to succeed to the presidency, then win the office by election? T. Roosevelt.

Who was the first Vice-President to be assigned administrative duties by the President? Wallace.

Who was the only Vice-President to succeed to the presidency upon the resignation of the President? Ford.

Which Vice-Presidents resigned? Calhoun, Agnew.

What Vice-President was selected by the Senate because the Electoral College failed to agree? R. Johnson.

Who was the first Vice-President nominated at a national political convention? Van Buren.

What state has produced the most Vice-Presidents? New York.

What Vice-Presidents died while in office? Clinton, Gerry, King, Wilson, Hendricks, Hobart, Sherman.

Who was the youngest Vice-President to succeed to the presidency upon the death of the President? T. Roosevelt, 42. **The oldest?** Truman, 60.

What teams of President and Vice-President were reelected to a second term? Washington and Adams, Monroe and Tompkins, Wilson and Marshall, F. Roosevelt and Garner, Eisenhower and Nixon, Nixon and Agnew.

What Vice-Presidents served under two different Presidents? Clinton, Calhoun.

What Vice-President took his oath of office in another country? King, in Havana, Cuba.

which he cast for the two men he considered best qualified for the presidency. Under this system, John Adams became the first Vice-President and Thomas Jefferson the second.

Adams and Jefferson developed different views of the vice-presidency. Adams wrote his wife: "My country has in its wisdom contrived for me the most insignificant office that ever the invention of man contrived or his imagination conceived." Jefferson declared that "the second office in the government is honorable and easy; the first is but a splendid misery."

The rise of political parties caused the breakdown of this election system. In 1796, the Electoral College gave the greatest number of votes to Adams, a Federalist. Jefferson, a Democratic-Republican, received the next largest number of votes, and became Vice-President. The conflicting party loyalties of the two men created discord in the administration.

In 1800, Jefferson and Aaron Burr both ran as Democratic-Republicans. They tied with 73 electoral votes each, and the election was given to the House of Representatives, where each state has one vote in a presidential election. Burr hoped for Federalist support, and tried to be elected President instead of Vice-President. But he failed. After 36 ballots, Jefferson won a majority of the votes, and Burr became Vice-President. The system's weakness became apparent during this election. In 1804, Congress adopted Amendment 12 to the Constitution, which provided for separate ballots for President and Vice-President. This solved the immediate problem, but it also lessened the prestige of the vice-presidency. The Vice-President was no longer elected as the second choice for the presidency.

In 1832, John C. Calhoun became the first Vice-President to resign. He resigned after being elected to fill a U.S. Senate seat from South Carolina.

Tyler Takes Over. The Constitution provides that in case of the death or disability of the President, "the powers and duties" of the office shall devolve on the Vice-President. How this would work remained uncertain until 1841, when William Henry Harrison died in office, the first President to do so. His Vice-President was John Tyler. Former President John Quincy Adams and other leaders believed Tyler should be called *acting President*, not President. They opposed Tyler's receiving the full presidential salary and even his occupying the White House. Tyler ignored them. He took the oath and title of *President*, occupied the White House, and asserted full presidential powers. His action was not challenged legally, and he thereby established the right of the Vice-President to full succession.

Vice-Presidents have responded in various ways when a President has become disabled. Vice-President Chester A. Arthur did not see James A. Garfield from the day Garfield was shot until he died 80 days later. Arthur received reports of the President's condition from Secretary of State James G. Blaine. He refused to assume the Chief Executive's duties for fear that he would be doing wrong. Vice-President Thomas R. Marshall also declined to take up the President's duties during Woodrow Wilson's six-month illness. During Dwight D. Eisenhower's illnesses in 1955 and 1956, Vice-President Richard M. Nixon presided at meetings of the Cabinet and the National Security Council. He kept in close touch with the President. These experiences, and the 1963 assassination of President John F. Kennedy, led to the proposal of the 25th Amendment to the United States Constitution. This amendment, ratified in 1967, establishes procedures for presidential and vice-presidential succession.

Growth of the Vice-Presidency. In 1791, Vice-President John Adams attended a Cabinet meeting. No other Vice-President did so until after World War I. In 1918, President Wilson asked Vice-President Marshall to preside over the Cabinet while Wilson was attending the Paris Peace Conference. After Wilson returned home, Marshall was again excluded.

President Warren G. Harding invited Vice-President Calvin Coolidge to attend all Cabinet meetings. Coolidge did so until he became President after Harding's death. Vice-President Charles G. Dawes publicly declared that he would not attend Cabinet sessions, because if he did so "the precedent might prove injurious to the country." Therefore, Coolidge did not invite him to participate. Nor did President Herbert Hoover invite Vice-President Charles Curtis to take part in Cabinet meetings.

Since the first term of President Franklin D. Roosevelt, all Vice-Presidents have regularly attended Cabinet meetings. President Eisenhower strengthened the vice-presidency further by directing that Vice-President Nixon should preside at Cabinet meetings in the President's absence. Previously, the secretary of state had presided at such times. Congress made the Vice-President a member of the National Security Council in 1949. Eisenhower directed in 1954 that the Vice-President, rather than the secretary of state, should preside over council meetings when the President was absent.

President John F. Kennedy further extended the duties of the Vice-President. His Vice-President, Lyndon B. Johnson, served as chairman of the National Aeronautics and Space Council and headed the President's Committee on Equal Employment Opportunity. After he became President, Johnson continued to upgrade the vice-presidency. Vice-President Hubert H. Humphrey attended meetings of the Department of State Policy Planning Council. He helped unify the Johnson Administration's antipoverty and civil rights programs.

President Richard M. Nixon also gave important duties to his Vice-President, Spiro T. Agnew. As chief of the Office of Intergovernmental Relations, Agnew promoted the Administration's domestic programs among state and local officials. Agnew's outspoken defense of Nixon's policies against criticism by liberals and the news media made the Vice-President a controversial figure.

In 1973, Agnew became the second Vice-President to resign. He left the office when a federal grand jury began to investigate charges that he had participated in widespread graft as an officeholder in Maryland. Nixon nominated House Minority Leader Gerald R. Ford to succeed Agnew. Ford became the first Vice-President chosen under terms of the 25th Amendment to the United States Constitution. In 1974, Nixon resigned. Ford then became the first Vice-President to succeed to the presidency because of a President's resignation. For-

mer New York Governor Nelson A. Rockefeller replaced Ford as Vice-President. IRVING G. WILLIAMS

Related Articles. See the biography of each Vice-President listed in the *table* in this article. See also:

Cabinet
Constitution of the U.S. (Amendment 12; Amendment 20; Amendment 25)
Electoral College
Flag (picture: Flags of the U.S. Government)
Franking and Penalty Privileges
National Security Council
President of the United States
Presidential Succession
Senate

Outline

I. Choosing a Vice-President
A. Nomination
B. The Campaign
C. Election
D. Inauguration
E. The 25th Amendment

II. Roles of the Vice-President
A. A Typical Day
B. President of the Senate
C. Administration and Policy-Making
D. Social Duties

III. History of the Vice-Presidency

Questions

What is meant by "balancing a ticket"?
What are the legal qualifications for a vice-presidential candidate?
What are the official duties of the Vice-President?
In what various ways have Vice-Presidents responded when a President has become disabled?
What happened in 1800 to bring about a change in the method of electing the Vice-President?
How did the vice-presidency change after 1804?
How has the vice-presidency grown in importance since World War I?
How can a Vice-President be removed from office?
How is the Vice-President elected if the Electoral College fails to select one by majority vote?
What is the annual salary of the Vice-President?

VICEROY. See BUTTERFLY (color picture).

VICEROY is an official who rules a province or colony in the name of a king. The term *viceroy* means *in place of the king*. The British governor general of India was a viceroy. Before 1920, the lord lieutenant of Ireland was often called a viceroy.

VICHY, *VISH ee* (pop. 33,506), is a resort town on the Allier River in south-central France. For location, see FRANCE (political map). During World War II, Vichy was the capital of unoccupied France from July, 1940, until November, 1942. Marshal Henri Philippe Pétain headed the Vichy government. In November, 1942, German troops occupied all France. Vichy remained the seat of the German-controlled French government until 1944. Then Allied troops invaded France and freed it.

During the months that France was under German occupation, the name *Vichy* came to stand for *collaboration* with the Germans. The name took on this meaning because French government officials in Vichy made compromises and concessions to meet German demands. For many years before World War II, health-giving waters had made Vichy famous as a health resort. ROBERT E. DICKINSON

VICKSBURG, Miss. (pop. 25,478), is a major Mississippi River port. It is on the west border of the state (see MISSISSIPPI [political map]). Vicksburg's chief products include chemicals, fabricated metals, and machinery.

The Spaniards established an outpost in the area about 1790. In 1825, the settlement was incorporated as Vicksburg. During the Civil War, Vicksburg fell to the Union Army on July 4, 1863, after a 47-day siege (see CIVIL WAR [Vicksburg]). Vicksburg is the seat of Warren County and has a commission form of government. CHARLOTTE CAPERS

VICKSBURG NATIONAL MILITARY PARK. See NATIONAL PARK SYSTEM (table; picture).

VICO, *VEE koh,* **GIOVANNI BATTISTA** (1668-1744), was an Italian scholar and philosopher. His most important book was *The New Science* (1725). He is considered by many scholars to be the leading pioneer of modern historical studies. The German scholars and philosophers who founded modern historical studies in the late 1700's and early 1800's used his theories. Vico rejected the emphasis most scholars of his time gave to science and mathematics. He believed that history was the most knowable study. He pointed out that we can really know only what we have made, and history is something that man himself has made.

Vico worked out rules for studying history. He tried to find similarities between different periods, and laws of historical development common to all civilizations. The "heroic" age of Homer in ancient Greece, for instance, resembled the European Middle Ages. These ages were both followed by "classical" periods of reason, science, and industrial development. Vico was born in Naples. ROLAND N. STROMBERG

VICTOR was the name of three popes of the Roman Catholic Church. They served as follows:

Victor I, Saint	(189-199)
Victor II	(1055-1057)
Victor III	(1086-1087)

Saint Victor I (?-199) took a vigorous stand against Eastern bishops who celebrated Easter on the 14th day of Nisan in the Jewish calendar instead of Sunday. He enforced the Roman practice of Easter celebration on Asiatic bishops. He was born in Africa.

Victor II (1018?-1057) was the fourth and last of the German popes chosen by the Holy Roman Emperor. He accepted the papacy on condition that Emperor Henry III return to the Holy See its lawful possessions. He also fought clerical marriage and *simony* (the buying or selling of sacred offices).

Victor III (1027?-1087) followed the reform and political policies of Pope Gregory VII, and excommunicated the antipope, Clement III (see GREGORY [VII]). He did his greatest work as abbot of Monte Cassino and negotiator for the papacy with the Normans in southern Italy. THOMAS P. NEILL and FULTON J. SHEEN

VICTOR EMMANUEL was the name of a king of Sardinia and two kings of Italy.

Victor Emmanuel I (1759-1824) ruled as king of Sardinia from 1814 to 1821. Faced with a revolution in 1821, he abdicated his throne in favor of his brother, Charles Felix, rather than grant his people a constitution and declare war on Austria.

Victor Emmanuel II (1820-1878) was king of Sardinia from 1849 to 1861 and the first king of Italy from 1861 to 1878. He took the leadership in uniting Italy. His first step was to get the Austrians out of Italy. He made an alliance with France, and in 1859 the two countries defeated Austria. Victor Emmanuel gained Lombardy. Revolutions began in central Italy shortly after. In 1860, Giuseppe Garibaldi conquered the Kingdom of

the Two Sicilies. As a result, central Italy (except for Rome) and the Kingdom of the Two Sicilies joined Sardinia in 1861 to form a united kingdom of Italy. Victor Emmanuel became king. Venetia joined the kingdom in 1866, and Rome joined in 1870. Victor Emmanuel II was born in Turin, Italy.

Victor Emmanuel III (1869-1947) became king of Italy after the assassination of his father, Humbert I, in 1900. The people honored and respected him during the early years of his reign, but later they came to despise him. Victor Emmanuel refused to proclaim martial law to stop Benito Mussolini's march on Rome in 1922. The king made no protest when Italy became a fascist dictatorship. Victor Emmanuel tried to save the monarchy in 1946 by abdicating in favor of his son, Crown Prince Humbert. But the gesture proved futile, because the Italian people voted to abolish the monarchy in a 1946 election. Victor Emmanuel III was born in Naples.

R. JOHN RATH

Related Articles in WORLD BOOK include:

Cavour, Count di	Mussolini, Benito	Savoy
Fascism	Papal States	Sicilies, Kingdom of the Two
Garibaldi, Giuseppe	Sardinia, Kingdom of	
Italy (History)		

VICTORIA (1819-1901) was one of the greatest rulers in English history. She was queen of the United Kingdom of Great Britain and Ireland, and empress of India. *The Victorian Era*, named for her, included most of the 1800's. In this era, Great Britain reached the height of its power. The Victorian Age featured great industrial expansion at home and imperial expansion abroad. A period of sentiment and self-indulgence ended as Victoria came to the throne. The English people became high-minded, modest, self-righteous, and enterprising.

Historical Pictures Service

Queen Victoria

Victoria ruled for 63 years, from 1837 to 1901, the longest reign of any British monarch. She became queen at a time when the people neither liked nor respected the throne. But by being above reproach she raised the throne to a position of respect and veneration. In later years, she became the symbol of Great Britain's greatness. Victoria was a wise and capable monarch, but the greatness of her country was due more to such ministers as Sir Robert Peel, Lord Palmerston, Benjamin Disraeli, William Gladstone, and Lord Salisbury than it was to her. Great Britain was a constitutional monarchy, and Victoria could only warn, advise, or encourage the prime minister.

Events of Her Reign. Many great events took place during Victoria's reign. In 1837, small rebellions broke out in Canada. Upper and Lower Canada were united in 1840 and given self-government. Britain fought the Opium War in China (1839-1842). It also fought in the Crimean War from 1854 to 1856, and in the South African War from 1899 to 1902.

A mutiny broke out in India in 1857, and the following year India was transferred from the East India Company to government control. Victoria was proclaimed empress of India in 1877. The British seized control of Egypt and many other areas. The colonies in British North America and Australia were federated and became powerful, self-governing states. Britain became a free-trade country. The franchise was extended, and local government democratized. In Ireland, the Anglican Church was disestablished and the land system reformed. Parliament passed acts improving labor conditions, making education compulsory, and reforming the civil service.

Early Years. Victoria was born at Kensington Palace on May 24, 1819. She was the only child of Edward, Duke of Kent, fourth son of George III, and of Victoria Maria Louisa, daughter of Francis, Duke of Saxe-Coburg-Saalfeld. Victoria's father died before she was a year old, and she was reared by her mother.

Her uncle William IV died on June 20, 1837, and she immediately followed him on the throne. She was crowned at Westminster Abbey on June 28, 1838. When she came to the throne, the union between Britain and the Kingdom of Hanover (in Germany) ended, because a woman could not occupy the Hanoverian throne. Victoria had been carefully reared and had had little contact with the outside world. Lord Melbourne, her first prime minister, educated her in politics and government, and in the art of living.

In February, 1840, the queen married her cousin, Prince Albert of Saxe-Coburg-Gotha. It was a happy marriage. The prince consort had a difficult position, but he carried out his duties well. He was a student, philanthropist, and businessman, and the people respected him. Victoria and Albert had four sons and five daughters. The eldest child, Princess Victoria, married the crown prince of Germany.

In 1861, Prince Albert died. Victoria never recovered from her grief. She withdrew from social activities and dressed in mourning for many years. Avoiding London, she lived for the most part at Osborne on the Isle of Wight, and at Balmoral in Scotland. After the death of her husband, the only adviser to whom she showed affection was Benjamin Disraeli, whom she called "Dizzy." In 1887, the people of the empire celebrated the golden jubilee of her reign with great rejoicing. Ten years later, her diamond jubilee was celebrated as a great "festival of empire."

Victoria died at her winter home on the Isle of Wight on Jan. 22, 1901. Her eldest son then became Edward VII.

JAMES L. GODFREY

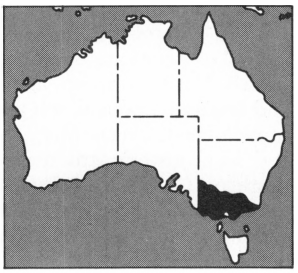
Related Articles in WORLD BOOK include:

Albert, Prince	English Literature (The Victorian Age)
Connaught, Duke of	Great Britain (History)
Doll (Famous Collectors)	Windsor
Edward (VII) of England	

VICTORIA is the smallest state on the Australian mainland. Only the island of Tasmania covers a smaller area among the Australian states. Victoria, one of Australia's chief farming regions, was also the first area in Australia to develop a large scale manufacturing industry. This activity began in the 1860's. Melbourne, on Port Phillip Bay, is the capital (see MELBOURNE).

Location, Size, and Description. Victoria lies at the southeastern tip of Australia. It covers 87,884 square

miles (227,619 square kilometers). See AUSTRALIA (political map).



Victoria Is Shown In Black.

Low hills border the coast line of Victoria. The Dandenong Ranges stand east of Melbourne. The Great Dividing Range and several other mountain ranges cover much of eastern and central Victoria. In the northeast, these mountains are called the Australian Alps. Mount Bogong, the highest peak in Victoria, rises 6,508 feet (1,984 meters) in the eastern part of the state.

Rivers and Bays. The Murray River is Victoria's chief waterway (see MURRAY RIVER). The Hume Dam on this river irrigates the northern river valley. Other rivers include the Goulburn, Loddon, Campaspe, and Mitta Mitta (all tributaries of the Murray), and the Glenelg, Snowy, and Yarra. Port Phillip Bay, one of the largest and deepest bays in the world, covers 875 square miles (2,266 square kilometers).

Natural Resources. The discovery of gold in 1851 brought the first large population wave to Victoria. *Lignite* (brown coal) is now the chief mineral produced. In 1957, the state began developing a lignite deposit in the Gippsland district. This is believed to be the largest single lignite deposit in the world. Other mineral resources include antimony, silver, and tin. Victoria also has fertile soil and gum and eucalyptus forests.

Climate. Victoria has a cooler climate than most of Australia, because it lies farther south than the rest of the mainland. January temperatures average 70° F. (21° C), and July temperatures average 50° F. (10° C). From 10 to 20 inches (25 to 51 centimeters) of rain falls in the northwestern section of the state. Most of the southern part has an annual rainfall of 20 to 40 inches (51 to 100 centimeters). A small area in the east has from 40 to 60 inches (100 to 150 centimeters).

The People and Their Work. Victoria has a population of 3,496,161, including 6,100 Aborigines. About two-thirds of the people live in the Melbourne metropolitan area. Most of them are of British descent.

Chief crops include barley, hay, oats, potatoes, and wheat. Many kinds of fruit grow in Victoria. Stock raising and dairy farming are also important industries. The state has iron foundries, textile factories, and woolen mills. Products include agricultural implements, chemicals, dyes, foods, leather, paints, paper, rubber products, tobacco, and wines.

Transportation. The state has about 4,000 miles (6,400 kilometers) of railroads and 101,500 miles (163,350 kilometers) of roads. Several airlines serve Victoria.

Education. Children between the ages of 6 and 15 must attend school. Elementary and high school education is free. The University of Melbourne was founded in 1853. Monash University was founded in 1958.

Government. The British Crown appoints a governor for Victoria, on the advice of the Victorian Parliament. But a premier actually heads the government, assisted by a cabinet of ministers. The legislature consists of a 34-member upper house that serves six years, and a 66-member lower house that serves three years. Victoria sends 10 senators and 33 representatives to the federal Parliament at Canberra.

History. George Bass, a British navigator, sighted the eastern coast of Victoria in 1797. But colonists did not settle permanently until 1835. The territory formed part of New South Wales until 1851, when it became a separate colony. It was named for Queen Victoria.

In 1851, discoveries of gold in Ballarat and Bendigo brought thousands of settlers to Victoria. After the gold rush, many miners became farmers. The settlers won self-government in 1855. Victoria joined the Commonwealth of Australia in 1901. C. M. H. CLARK

VICTORIA (pop. 61,761; met. area pop. 195,800) is the capital of British Columbia and the second largest city of the province. Only Vancouver is larger. A deep harbor at nearby Esquimalt serves as Canada's chief naval base on the west coast. Victoria lies on the southeastern tip of Vancouver Island, 60 miles (90 kilometers) southwest of the city of Vancouver. For location, see BRITISH COLUMBIA (political map).

About 2 million tourists visit Victoria annually, and many retired people move to the area from other parts of Canada. Victoria's attractions include its scenic surroundings and the "English" appearance of the city itself. Its narrow streets and neat public and private gardens resemble those of England. Victoria also has a milder climate than any other Canadian city. Victoria's temperatures average 40° F. (4° C) in January and 60° F. (16° C) in July.

Description. Victoria covers about 7 square miles (18 square kilometers). Its metropolitan area occupies about 155 square miles (401 square kilometers).

The buildings of the British Columbia Parliament overlook Victoria Harbor. The nearby Empress Hotel is famous for its elegance. The world's finest collection of totem poles may be seen in the British Columbia Provincial Museum and nearby Thunderbird Park. Victoria's modern City Hall borders Centennial Square, an attractive open area in the downtown section. The Royal Roads Military College and the University of Victoria lie just outside the city.

About 30 per cent of the workers of the Victoria metropolitan area are employed by the tourist industry or other service fields. About 20 per cent of the workers have jobs with the federal, provincial, or local government. Retired people make up about a fifth of Victoria's population.

History. Coast Salish Indians lived in what is now the Victoria area before white men arrived there. The Hudson's Bay Company of London, a fur-trading organization, founded Victoria in 1843. The settlement was named for Queen Victoria of Great Britain. It served as the capital of the Colony of Vancouver Island from 1858 to 1866, when the island became part of British Columbia. Victoria has been the capital of British Columbia since 1868.

The city grew steadily through the years. The British Royal Navy established a naval base at the nearby harbor in 1865. Tourism became important to the city after the Canadian Pacific Railway opened the Empress Hotel in 1908. Ferry lines linked the city with railroad terminals on the mainland. The Harbor was a key

Canadian ship-building center during World War I (1914-1918) and World War II (1939-1945).

During the 1960's and 1970's, Victoria completed several projects that beautified the city and preserved its older areas. These projects included renewal of a historic downtown residential district and construction of new docks and walkways for the harbor. Victoria has a council-manager form of government. J. B. B. SHAW

See also BRITISH COLUMBIA (pictures).

VICTORIA, Hong Kong (pop. 520,932), serves as the capital of that British crown colony. Offices and government buildings stand along the waterfront in the central part of Victoria. The crowded Chinese section surrounds the downtown area. See also HONG KONG.

VICTORIA, LAKE. See LAKE VICTORIA.

VICTORIA, UNIVERSITY OF, is a coeducational university at Victoria, B.C. It receives financial support from the province. It offers courses in arts, education, fine arts, and science, and grants bachelor's, master's, and doctor's degrees. The university was founded in 1903 as Victoria College, an affiliate of McGill University. In 1920, it affiliated with the University of British Columbia. It became a separate university in 1963. For enrollment, see CANADA (table: Universities and Colleges). MALCOLM GORDON TAYLOR

VICTORIA CROSS. See DECORATIONS AND MEDALS (Decorations and Medals of Other Countries).

VICTORIA DAY commemorates the birthday of Queen Victoria on May 24, 1819. The people of the British Commonwealth have always celebrated the birthday of the ruling monarch as a patriotic holiday. During the long lifetime of Queen Victoria, her birthday came to have a special meaning. After her death, people continued to celebrate her birthday as a day on which to express their loyalty to the British Empire.

In the early 1900's, the people of Canada celebrated Queen Victoria's birthday as Empire Day. The name was changed to Commonwealth Day in 1947. Canadians now celebrate Victoria Day and the official birthday of the reigning monarch as a legal holiday on the Monday before May 25. RAYMOND HOYT JAHN

VICTORIA DESERT. See GREAT VICTORIA DESERT.

VICTORIA FALLS is a waterfall that David Livingstone sighted in South Africa in 1855. The explorer named it in honor of Queen Victoria of England. Victoria Falls lies between Rhodesia and Zambia, about halfway between the mouth and source of the Zambezi River. The Zambezi is about 1 mile (1.6 kilometers) wide at this point and drops suddenly into a deep, narrow chasm. A canyon about 40 miles (64 kilometers) long permits the water to flow out. The height of the falls varies from 256 feet (78 meters) at the right bank to 355 feet (108 meters) in the center.

The mist and spray created by Victoria Falls can be seen for a great distance. This cloud and the constant roar caused the people of the area to name the falls *Mosi oa Tunya* (smoke that thunders). A hydroelectric plant produces a small amount of power at the falls. A railway bridge crosses the river just below the point where the waters rush out of the chasm. HARRY R. RUDIN

See also AFRICA (color picture); RHODESIA; SEVEN WONDERS OF THE WORLD; WATERFALL.

VICTORIA LAND is part of the Antarctic subcontinent. It lies on the shore of the Ross Sea almost due south of New Zealand. Sir James Ross claimed the region for Great Britain during his 1839-1843 expedition. Victoria Land is also called South Victoria Land.

VICTORIAN AGE. See ENGLISH LITERATURE (The Victorian Age); GREAT BRITAIN (History).

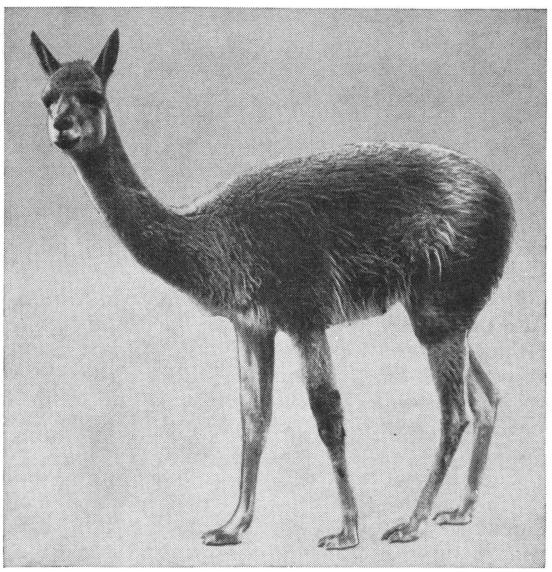
VICTORY, WINGED. See WINGED VICTORY.

VICTORY MEDAL. See DECORATIONS AND MEDALS.

VICUÑA, *vih KOON yuh,* is the smallest member of the camel family. It lives in the Andes Mountains of Bolivia, Chile, and Peru, in areas from 12,000 to 18,000 feet (3,660 to 5,490 meters) above sea level. Its home is generally near the snow line. The vicuña and guanaco are the two wild members of the camel family in South America. The other two, the alpaca and llama, are domesticated. None of the four has a hump.

The vicuña is $2\frac{1}{4}$ to 3 feet (69 to 91 centimeters) high at the shoulders and weighs 75 to 140 pounds (34 to 64 kilograms). It has a long, slender neck. Vicuñas eat grass. They usually live in herds which contain one male and 6 to 10 females. They have remarkable sight, speed, and endurance.

Vicuñas have finer fleece than any other wool-bearing animal. The hairs are less than half as thick as the finest sheep's wool. The color of the upper body is reddish yellow to deep tan or reddish brown. The belly and lower legs are white. The fleece grows until it hangs below the flanks and knees. Only the inner fleece is used. It is especially good for high-grade worsted. So many vicuñas were killed for their wool that the species had become rare by the 1960's. Peruvian law now protects the animals. The ancient Inca Indians protected vicuñas and hunted them only once in four years. Only royalty could use the fleece.



New York Zoological Society

The Vicuña Is a Humpless Member of the Camel Family.

Scientific Classification. The vicuña belongs to the camel family, *Camelidae.* It is classified as genus *Lama,* species *L. vicugna.* DONALD F. HOFFMEISTER

See also ANIMAL (picture: Animals of the Mountains).

VIDEO. See TELEVISION.

Joachim Messerschmidt, Bruce Coleman Inc.

Vienna, the capital of Austria, ranks as a leading cultural center of Europe. The city has long been famous for its art galleries, churches, libraries, museums, and theaters. The Burgtheater, *left,* is one of Vienna's many landmarks.

VIENNA, *vee EHN uh* (pop. 1,614,841), is the capital and largest city of Austria. The city lies in northeastern Austria, on the south bank of the Danube River. For location, see AUSTRIA (political map). Vienna is Austria's leading cultural, economic, and political center. Its name in German is *Wien.*

Vienna became the capital of the Austrian (later the Austro-Hungarian) Empire under the Hapsburgs (or Habsburgs), a royal family that ruled in central Europe from 1273 to 1918. During the 1700's and 1800's, Vienna won fame as a world center of education, literature, music, and science. The Viennese people became known for their gaiety, wit, and enjoyment of life.

The Austro-Hungarian Empire collapsed after World War I ended in 1918, and Vienna lost much of its importance. After the end of World War II in 1945, Vienna became a center for international conferences and the location of several international agencies.

The City covers about 160 square miles (415 square kilometers) at the eastern end of a narrow plain between the Carpathian Mountains and the Alps. An important mountain gap through the Carpathians is just east of Vienna. The city's location at this transportation crossroads played an important role in its growth and economic development. Trade and communication routes run through Vienna in all directions.

The old "Inner City" forms the center of Vienna. This area includes many of the city's historical buildings and landmarks as well as its most fashionable shopping districts. The famous St. Stephen's Cathedral stands at the heart of the Inner City. Several blocks west is the Hofburg, a palace that consists of both modern buildings and structures erected during the Middle Ages. The palace includes the royal apartments, now occupied by the president of Austria; the Imperial Library; several museums; and the Spanish Riding School. Nearby lie two of Vienna's most beautiful parks, the Burggarten and the Volksgarten, which has a famous collection of rose trees.

A band of streets called the Ringstrassen encircles the Inner City. Some of Vienna's most impressive public buildings line these streets. They include the Museum of Art History, City Hall, the Opera House, the Parliament Building, and the Stock Exchange. These buildings date from the second half of the 1800's.

The older suburban districts of the city lie outside the Ringstrassen. They became part of Vienna during the 1800's. Several important buildings are in the suburbs, including the Karlskirche (Church of St. Charles) and the Belvedere Palace. These structures rank among the finest existing examples of *baroque* architecture, a highly decorative style that developed in the 1600's and 1700's. The noted Austrian architect Johann Bernhard Fischer von Erlanch designed several Viennese buildings, including the Karlskirche and the magnificent Schönbrunn Palace. The palace stands at the southwestern edge of the city. The Schönbrunn Zoo, which lies on the palace grounds, was established in 1752 and ranks as the world's oldest existing zoo. Belvedere Palace, the Karlskirche, and Schönbrunn Palace attract large numbers of tourists.

A long park called the Prater lies north of Vienna along the Danube. The Vienna Woods line the western edge of the city.

The People. Most Viennese are German-speaking Austrians. Many Czechs and Hungarians also live in the city, but nearly all of them speak German in addition to their national language. The Viennese wear clothing much like that worn in the United States, but they dress up somewhat more than Americans do. They

wear Austrian folk costumes on holidays and other special occasions. Viennese foods reflect the mixture of nationalities in the city. Many of the people like to drink coffee and eat elegant pastries at pastry shops called *Konditoreien*. They also enjoy visiting the wine houses north of the city to drink freshly made wine, called *Heurigen*.

Most Viennese own or rent apartments in four- or five-story buildings. Some suburban families live in their own homes. The city has built apartment complexes to replace residences destroyed during World War II, but housing shortages continue to be a problem.

Education and Cultural Life. Vienna is the home of many fine institutions of higher learning. They include the Academy of Fine Arts, the Academy of Music, the Technical University, and the University of Vienna.

The city has long been known for its excellent museums and art galleries, including the Albertina and the Museum of Art History. The city also has several libraries, among them the National Library. Musical events take place at such opera houses as the Musikverein, the State Opera House, and the Volksoper (see EUROPE [picture: Beautiful Opera Houses]). The famous Vienna Boys' Choir sings every Sunday in the Hofburgkapelle, one of the city's many churches. Major theaters include the Burgtheater, which is financially supported by the Austrian government, and the Theater in der Josefstadt.

A number of famous composers, scientists, and writers have lived in Vienna. Such composers as Ludwig van Beethoven, Johannes Brahms, Joseph Haydn, Wolfgang Amadeus Mozart, Franz Peter Schubert, and Johann Strauss all made their home there.

Economy. Vienna is the chief industrial city of Austria. Industries in the city manufacture chemicals, clothing, leatherware, medicine, and radio and television products.

The city has an excellent system of public transportation, with streetcars, elevated and subway trains, and buses. Most of the people use public transportation rather than private automobiles in the city.

History. Prehistoric tribes lived on the site of what is now Vienna. In 15 B.C., the Romans established a frontier post there named Vindobona. After the fall of the Roman Empire in the A.D. 400's, invading Germanic tribes took over the area. During the late 800's, the Magyars, a people from Hungary, gained control of the city, which by then was called Vienna. They lived there until the Germans conquered them in the mid-900's.

In 1273, a member of the Hapsburg family became Holy Roman Emperor. The Hapsburgs made Vienna their capital, and the city grew rapidly in wealth and importance. The Turks attacked Vienna in 1529 and again in 1683, but they failed to capture the city. Some of Vienna's most beautiful baroque palaces and churches were built during the 1700's.

After World War I, Vienna became the capital of the Austrian republic. German troops occupied Vienna during World War II, and the city was badly damaged by Allied bombing. From 1945 to 1955, the people lived under the control of the victorious Allies.

The Viennese rebuilt almost all the destroyed or damaged landmarks, and the city regained much of its former spirit and wealth. During the 1970's, construction began on several new hotels and an expanded subway system. Work also started on a United Nations (UN) center consisting of several buildings. The UN planned to use this center as a third conference site, along with the ones in New York City and Geneva, Switzerland. Completion of the center was scheduled for 1978. WILLIAM J. MCGRATH

See also AUSTRIA (pictures).

VIENNA, CONGRESS OF, was a meeting of European political leaders in 1814 and 1815. The men met after the defeat of Napoleon to restore royal rulers to power and to change the boundaries of European countries. They hoped to return the European political system to the system that existed before 1789. The French Revolution of 1789 had ended royal rule in France. Napoleon had conquered many European countries and had overthrown their rulers in the early 1800's. See FRENCH REVOLUTION; NAPOLEON I.

Prince von Metternich of Austria, William von Humboldt of Prussia, Lord Castlereagh of Great Britain, and Czar Alexander I of Russia plotted to control the congress. But they could not agree on how to divide Poland and Saxony, a Germanic province. French diplomat Talleyrand took advantage of their disagreements to give defeated France a voice at the congress.

The Congress of Vienna changed the borders of countries without considering the wishes of people living in the countries. For example, Belgium and The Netherlands were united in spite of their different languages and customs. Austria took some Italian provinces. Sweden got Norway from Denmark. Austria, Prussia, and Russia took parts of Poland. A Germanic Confederation replaced the Holy Roman Empire. Russia got Finland from Sweden and Bessarabia, in southeastern Europe, from Turkey. The Congress of Vienna also restored to power royal rulers in France, The Netherlands, and several German and Italian states. ROBERT G. L. WAITE

See also AIX-LA-CHAPELLE, CONGRESS OF.

VIENTIANE, *vyan TYAHN* (pop. 130,000), is the administrative capital and largest city of Laos. The king's palace stands in Luang Prabang, the royal capital. Vientiane lies on the Mekong River near the border between Thailand and Laos (see LAOS [map]).

Vientiane is an important trading center. It has an airport, and ferryboats link the city with a railroad that runs south to Bangkok, Thailand. River transportation connects Vientiane with towns along the Mekong.

Vientiane formed part of the Kingdom of Lan Xang in the 1300's. During the 1700's, it became an independent kingdom. Siam (now Thailand) annexed the Kingdom of Vientiane in the early 1800's. The French made it part of Laos in 1893 and governed it as part of French Indochina until 1954. FRANK M. LEBAR

See also LAOS (History); LUANG PRABANG.

VIEQUES ISLAND. See PUERTO RICO (The Land).

VIERECK, PETER (1916-), an American poet and political writer, won the 1949 Pulitzer prize in poetry for *Terror and Decorum* (1948). His political books include *Shame and Glory of the Intellectuals* (1953). He was born in New York City.

VIETMINH. See VIETNAM.

James Pickerell, Black Star

The Rice Fields of Vietnam provide the basic food of the Vietnamese people. Most of the people in Vietnam are farmers, and rice is the chief crop.

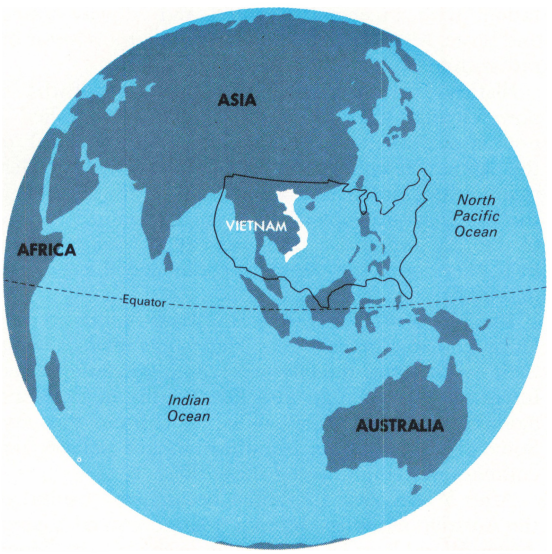
VIETNAM

VIETNAM, *VEE eht NAHM*, is a tropical land in Southeast Asia. Officially, it consists of two nations—*North Vietnam* and *South Vietnam*. However, in 1975, North Vietnam defeated South Vietnam in the Vietnam War. After the war, South Vietnam continued to operate under a government technically separate from that of North Vietnam. But the leaders of North Vietnam claimed that Vietnam had been, in effect, united into a single nation under their control.

Vietnam extends south from China in a long, narrow S-curve. It is about as large as California. Mountains cover most of western Vietnam. The land slopes from the mountains to the South China Sea in the east. Two important rivers—the Red River in North Vietnam and the Mekong River in South Vietnam—empty into the sea. Each river has built up a large delta. A narrow coastal plain connects the two deltas.

Most of the people of Vietnam live in villages on the deltas and the coastal plain. They raise rice and a few other crops on the fertile land. Many people who live along the coast are fishermen. Hanoi is the capital and largest city of North Vietnam. Saigon is South Vietnam's capital and largest city. Vietnam has few other large cities. Both North and South Vietnam have little industry.

In ancient times, the Vietnamese people lived in what is now North Vietnam. China ruled the area from about 100 B.C. until the A.D. 900's, when the Vietnamese formed an independent state. During the next



WORLD BOOK map

Vietnam lies in Southeast Asia. It has an area about 4 per cent as large as that of the United States, not including Alaska and Hawaii.

Dennis J. Duncanson, the contributor of this article, is Reader in Southeast Asian Studies at the University of Kent in Canterbury, England, and the author of Government and Revolution in Vietnam.

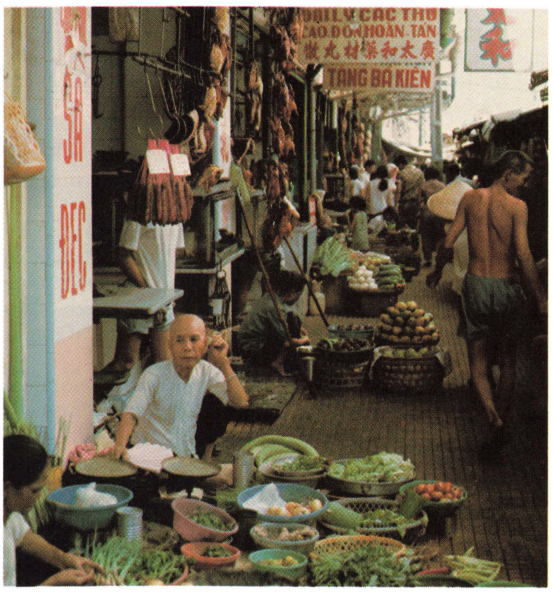
900 years, the Vietnamese gradually expanded their territory southward until they controlled all of what is now Vietnam.

France gained control of Vietnam in the late 1800's. The French governed the country until 1940, when Japan occupied it during World War II. After Japan's defeat in 1945, France tried to regain control of Vietnam. But the *Vietminh*, a group controlled by Communists and headed by Ho Chi Minh, gained power in northern Vietnam. Fighting broke out between French forces and the Vietminh in 1946.

In April, 1954, an international conference met in Geneva, Switzerland, to arrange a peace settlement for Vietnam. Called the Geneva Conference, it included representatives of the Vietminh and of the French-supported State of Vietnam. France, Great Britain, the United States, China, and Russia also sent representatives to the conference. In May, the Vietminh defeated the French. The Geneva Conference then decided to divide Vietnam temporarily into two zones. The Communists received control of North Vietnam. Non-Communist Vietnamese leaders supported by the West received control of South Vietnam. The conference also called for the country to be reunited through elections in 1956. But leaders of the North and the South could not agree on how to conduct the elections.

In 1957, Communists from both the South and North began attacking villages in South Vietnam. The Communists had as their goal the take-over of South Vietnam. The fighting developed into the Vietnam War. China, Russia, and other Communist countries sent aid to the Vietnamese Communists during the war. Non-Communist countries supported South Vietnam. The United States became the chief ally of the South. It backed the South's war effort with supplies and hundreds of thousands of troops. In 1973, the participants in the Vietnam War agreed to a cease-fire, and the United States withdrew its last combat troops from Vietnam. But North Vietnam soon resumed its war effort. In April, 1975, the Communists defeated South Vietnam, and took control of the country.

The *History* section of this article deals with the Vietnam War in general terms. For detailed information on the conflict, see VIETNAM WAR.



Paul J. Quirico

The Market Places of Saigon, South Vietnam's largest city, are crowded with peddlers. Many of them display their produce and other goods on the sidewalks in front of stores.

FACTS IN BRIEF

SOUTH VIETNAM

Capital: Saigon.

Official Language: Vietnamese.

Official Name: *Viet Nam Cong Hoa* (Republic of Vietnam).

Form of Government: Military rule (Communist).

Head of State and Government: President, or Chairman.

Political Divisions: 44 provinces, 11 cities with the rank of province.

Area: 67,108 sq. mi. (173,809 km²). *Greatest Distances*—north-south, 595 mi. (958 km); east-west, 390 mi. (628 km). *Coastline*—995 mi. (1,601 km).

Elevation: *Highest*—Linh, 8,524 ft. (2,598 m) above sea level. *Lowest*—sea level along the coast.

Population: *Estimated 1976 Population*—21,080,000; distribution, 73 per cent rural, 27 per cent urban; density, 313 persons per sq. mi. (121 persons per km²). *Estimated 1981 Population*—23,850,000.

Chief Products: *Agriculture*—rice, rubber. *Manufacturing*—cement, paper, textiles.

Money: *Basic Unit*—piaster.

NORTH VIETNAM

Capital: Hanoi.

Official Language: Vietnamese.

Official Name: *Viet Nam Dan Chu Cong Hoa* (Democratic Republic of Vietnam).

Form of Government: Communist dictatorship.

Head of State and Government: President, or Chairman.

Political Divisions: 23 provinces, 2 cities with the rank of province, 1 special zone.

Area: 61,294 sq. mi. (158,750 km²). *Greatest Distances*—north-south, 425 mi. (684 km); east-west, 380 mi. (612 km). *Coastline*—440 mi. (708 km).

Elevation: *Highest*—Fan Si Pan, 10,312 ft. (3,143 m) above sea level. *Lowest*—sea level along the coast.

Population: *Estimated 1976 Population*—24,136,000; distribution, 80 per cent rural, 20 per cent urban; density, 394 persons per sq. mi. (152 per km²). *1960 Census*—15,916,955. *Estimated 1981 Population*—27,043,000.

Chief Products: *Agriculture*—rice. *Manufacturing*—cement, farm tools, paper, textiles. *Mining*—coal.

Money: *Basic Unit*—piaster.

North Vietnam

In 1954, the Geneva Conference gave the Vietnamese Communist party control of North Vietnam's government. The party's official name is the *Dang Lao Dong Viet Nam* (Workers' Party of Vietnam). It is commonly called the *Lao Dong Party*.

The Lao Dong Party adopted a Constitution for North Vietnam in 1960. According to the Constitution, North Vietnam is a dictatorship of the working class under the leadership of the Lao Dong Party. In practice, the party completely controls the government. The 10- to 15-member *Politburo* (Political Bureau) of the party's Central Committee is the nation's most powerful body.

Political Parties. In addition to the Lao Dong Party, North Vietnam has two other parties, the Democratic Party and the Socialist Party.

These two parties have little power in the country. By law, the members of the parties must back the policies of the Lao Dong Party. The Lao Dong Party chooses all candidates for elected public office in North Vietnam, including the candidates of the Democratic and Socialist parties.

North Vietnamese people may not join a political party through their own choice. Instead, government officials decide who will be invited to join each party. Membership in the Lao Dong Party is a great honor in North Vietnam.

Political Rights. The Constitution of North Vietnam guarantees the people such rights as freedom of the press, speech, and religion. But, in practice, the government limits these rights.

National Government of North Vietnam is controlled by the Lao Dong Party. The party picks the candidates for the country's 453-member National Assembly, or legislature. According to law, the Assembly members serve four-year terms. But, actually, the terms may last for more than four years. The full National Assembly does not meet regularly and does not debate public issues. Instead, it holds occasional meetings, at which the Assembly members listen to reports on Lao Dong Party policies and pass unanimous resolutions endorsing the policies.

The National Assembly includes a Standing Committee, which performs most of the Assembly's day-to-day functions. The Politburo of the Lao Dong Party controls the Standing Committee.

A president, or chairman, serves as head of state and head of government in North Vietnam. A vice-president, or vice-chairman, assists him. The national government also includes a Council of Ministers. Members of the council head the government's departments. The Lao Dong Party chooses—and the National Assembly approves—the officials who serve in all these offices.

Local Government. People's councils conduct government business at the provincial level and on down to the village level in North Vietnam. Local government officials must follow Lao Dong Party policies. The people elect the officials of the lower levels of local government. These officials, in turn, elect the members of the higher levels of local government.

Courts. The Lao Dong Party controls the court system of North Vietnam. The court system includes the People's Supreme Court, local people's courts, and military courts.

Armed Forces. North Vietnam has an army, navy, and air force. The army has about 685,000 members, the air force about 12,000 members, and the navy about 3,000 members. In addition, about $1\frac{1}{2}$ million North Vietnamese people serve part-time in the country's militia and other military units.

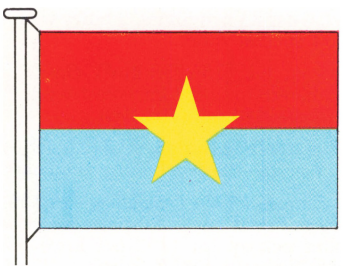
South Vietnam

South Vietnam fell to the Communist North on April 30, 1975, at the end of the Vietnam War. Before that time, South Vietnam was a republic headed by a president and a parliament. It also had its own court system and units of local government.

When the Communists took over, they abolished all existing laws and government units in South Vietnam. They installed their own officials to govern South Vietnam by military order.

The Lao Dong Party now holds all political power in South Vietnam, as it does in North Vietnam. The party appointed a member of its Politburo as commanding general of South Vietnam.

Technically, the governments of North and South Vietnam remained separate after the Communist takeover of the South. However, the leaders of North Vietnam claimed that the two countries had been, in effect, united into a single nation by the Communist victory.



South Vietnam's Flag has a yellow star that stands for Communism. The flag has a red stripe that symbolizes revolutionary struggle, and a blue stripe that stands for peace. The flag was adopted in 1975, when the Communists seized South Vietnam.

North Vietnam's Flag and Coat of Arms feature a star that stands for Communism. The rice and the cogwheel on the coat of arms represent the importance of agriculture and industry to the North. The flag was adopted in 1955.

Thousands of years ago, people moved into the Vietnam area from the north and from islands to the south. The Vietnamese people probably developed out of these two groups. Today, they make up almost 90 per cent of Vietnam's population. Chinese, Cambodians, and Montagnards are the largest minority groups in Vietnam.

Most Vietnamese have broad faces, high cheekbones, and straight black hair. On the average, the men stand a little over 5 feet (150 centimeters) tall and weigh about 120 pounds (54 kilograms). Most of the women are slightly smaller than the men.

Most of the Vietnamese people live on the Mekong and Red river deltas and on the coastal plain. The majority of the Chinese live in cities. Most Cambodians are farmers in southwestern South Vietnam. The Montagnards live in the mountains of Vietnam.

Population. Vietnam had a population of over 45 million in 1976. More than 24 million persons lived in North Vietnam, and about 21 million lived in South Vietnam. Vietnam's total population included about 3,250,000 Montagnards, 750,000 Chinese, and 600,000 Cambodians.

Saigon is the largest city in Vietnam and the capital of South Vietnam. It has a population of more than $1\frac{3}{4}$ million. In 1975, the Communists renamed Saigon *Ho Chi Minh City* in honor of the first president of North Vietnam. Other cities in the South with populations of over 100,000 are Cam Ranh, Da Nang, Gia Dinh, Hue, My Tho, Nha Trang, and Qui Nhon. Hanoi, the capital and largest city of North Vietnam, has a population of more than 400,000. Haiphong is the North's only other city with over 100,000 persons. See DA NANG; HAIPHONG; HANOI; HUE; SAIGON.

Paul J. Quirico

The Dance of the Dragon is performed during *Tet*, the traditional Vietnamese New Year. The dance is thought to bring good luck in the coming year. Tet falls in late January or February.

James Pickerell, Black Star

Vietnamese Children stand outside a village house on the Mekong Delta of South Vietnam. Most Vietnamese—like these children—have broad faces, high cheekbones, and straight black hair.

Way of Life. The Vietnamese way of life changed little for hundreds of years before the arrival of French colonists in the late 1800's. But since then, the influence of the French and the Communists, and the years of war during the mid-1900's, have brought great changes.

Before the late 1800's, Vietnam was an agricultural society built on strong family ties. Almost all the people lived in villages and farmed the land. A person owed loyalty to his family before all else, and he held the family's interests above his own. The oldest male was head of the family, and his oldest son was the second most important family member. In many cases, related families lived together. These *extended families* included the parents, their unmarried children, and the oldest married son and his wife and children. Parents chose their children's marriage partners. Families honored their ancestors by performing special ceremonies.

France gained control of Vietnam in the late 1800's. The French brought industry to the country, and many Vietnamese left their farms to work in the new factories in the cities. A new class of wealthy landowners also developed under French rule. They controlled more of the farmland than had any previous group in Vietnam. But the events that most changed the traditional Vietnamese way of life began in the mid-1900's.

In northern Vietnam, the Communists who came to power began transforming the society according to Communist principles. Party leaders extended their

control to all walks of life. The Communists forced people to live for the Communist Party instead of their families, and they urged women to perform the same jobs as men. The new rulers discouraged religious worship and the ceremonial honoring of ancestors. The Communist leaders set out to make similar changes in South Vietnam after they took over the country in 1975.

The Vietnam War brought other changes to Vietnamese life. It broke up families in both North and South Vietnam as fathers and sons left home to fight—sometimes against relatives. Hundreds of thousands of Vietnamese died in the war. In the North, areas near some cities were heavily bombed, forcing many people to move to the countryside. But almost all the ground fighting took place in rural areas of South Vietnam. It drove many families from their farm homes to the somewhat safer cities. In the cities, many of the South Vietnamese people learned Western customs from U.S. businessmen, government workers, and soldiers who came to Vietnam because of the war.

Clothing. The people of Vietnam wear mostly cotton clothing. But the styles differ in North Vietnam and South Vietnam.

In cities of North Vietnam, most men and women wear plain black trousers with tightly buttoned white or dark-colored jackets. Many people wear sandals made of worn-out automobile tires. In rural areas, most women dress in loose-fitting shirts and skirts. Some men wear coatlike garments that hang to the knees. Most rural people go barefoot. Few North Vietnamese wear Western-style clothing.

In the cities of South Vietnam, most people dress in Western-style clothes. Rural men and women usually wear loose-fitting trousers and long-sleeved shirts. Most of these people go barefoot or wear shoes with wooden soles.

Housing in rural areas differs in North and South Vietnam because of differences in climate. In the North, which is cooler, many people build simple wood or bamboo houses with tiled roofs. In the warmer South, most families have homes with walls and roofs made of palm leaves or straw. Some of the homes in Vietnamese cities are constructed of brick or stone.

Food. Most Vietnamese eat chiefly fish, rice, and vegetables. Rice has long been the basic food in Vietnam. Rice shortages during the Vietnam War forced many people in Vietnam to substitute foods imported from other countries.

Language. Vietnamese is the official language of both the North and the South. The people speak three major *dialects* (local forms) of Vietnamese—northern, central, and southern. But these dialects differ little from one another. Many members of the country's minority groups speak Vietnamese in addition to their own languages. There are about 20 Montagnard languages. Many Vietnamese people, especially those living in the cities, can also speak English, French, Chinese, or Russian.

The Vietnamese language developed over thousands of years. People living in the Red River Delta more than 2,000 years ago probably spoke the original form of Vietnamese. Through the years, the Vietnamese people added many Chinese words and a few French words to their language.

All the basic words of the Vietnamese language have only one syllable. Many other words are formed by combining two one-syllable words. In speaking, the people use various tones to indicate the different meanings a word may have. The modern form of written Vietnamese was developed by French missionaries during the 1600's. It uses the same letters as those used in French, English, and many other languages. Special markings over or under letters serve the same purpose in

Carl Purcell

Refugees in South Vietnam received food and shelter at refugee camps during the Vietnam War. Most of the fighting took place in the rural areas of the South. Millions of people sought safety in the cities or, like this family, fled to refugee camps on the Mekong Delta.

written Vietnamese as do tones in the spoken language. Before the 1600's, the Vietnamese used a system of writing made up mostly of Chinese characters and some Vietnamese symbols.

Education. After the division of Vietnam in 1954, both the North and South made special efforts to expand their educational systems. But many schools were destroyed in the Vietnam War, and the war effort required the money and materials needed to build new schools. In addition, Vietnam has a shortage of trained teachers. In spite of such problems, most of the Vietnamese people can read and write.

The Lao Dong Party controls the operation of all schools in North Vietnam. The educational system of the North includes general elementary, middle, and high schools and vocational schools, which train skilled workers.

Institutions of higher education in the North include the University of Hanoi and more than 15 colleges and specialized schools. An adult education program teaches reading and writing.

Before the Communist take-over, South Vietnam's school system also included general elementary, middle, and high schools and vocational schools. The law required all children in South Vietnam to complete at least three years of elementary school education. South Vietnam had three colleges and five universities, of which the University of Saigon was the largest. In 1975, the Communists began planning a reorganization of the South Vietnamese educational system.

Religion. The constitutions of both North and South Vietnam guarantee freedom of religion. But the Communist leaders of Vietnam discourage all religious practices.

Most of the Vietnamese people who practice a religion are Buddhists. Many of these people also worship the spirits of animals and plants and believe in the teachings of Confucianism and Taoism. About 10 per cent of the South Vietnamese are Roman Catholics. Two small religious groups—the Hoa Hao and the Cao Dai—have developed since 1900 in the South. Hoa Hao is closely related to Buddhism. Cao Dai combines certain beliefs of Taoism and Buddhism with those of several other religions. See BUDDHISM.

The Arts. Poetry has long been the most popular form of literature in Vietnam, and poets have always been highly respected. Most Vietnamese can recite at least a few verses of "Kim Van Kieu," a poem that tells of an unhappy love affair. This work of more than 3,000 lines was written by the poet Nguyen Du, who lived during the late 1700's and early 1800's. Today, political poems frequently appear in Vietnamese magazines and newspapers.

Novels began to gain wide popularity in Vietnam during the years of French rule, partly because the French introduced the printing press into the country. The printing press made books available to many people for the first time. Novels remain popular, especially in the South. But the Communists now carefully regulate the books the people may read.

Vietnamese painting shows the influence of both ancient Chinese and modern French art. Examples of traditional Vietnamese architecture include mostly *pagodas* (temples), tombs, and old royal palaces.

Bernard Martell from Mark Jury

Rural Homes in Vietnam differ in the South and North. In South Vietnam, which is warmer, some homes have walls and roofs covered with straw, *above*. Other homes are made with palm leaves. In the cooler North, many people build bamboo or wood houses with tiled roofs.

Vietnam occupies the east coast of the Indochinese Peninsula. The Vietnamese people sometimes describe their country as two rice baskets hanging from opposite ends of a farmer's carrying pole. In the North, the Red River Delta forms one "basket." The Mekong Delta in the South forms the other. A narrow stretch of land in central Vietnam forms the "carrying pole" that connects the deltas.

Vietnam extends about 1,000 miles (1,600 kilometers) from China south to the Gulf of Thailand. At its widest point—in the North—Vietnam extends almost 400 miles (640 kilometers) from Laos to the Gulf of Tonkin. At its narrowest point—in central Vietnam—it is only about 30 miles (48 kilometers) wide.

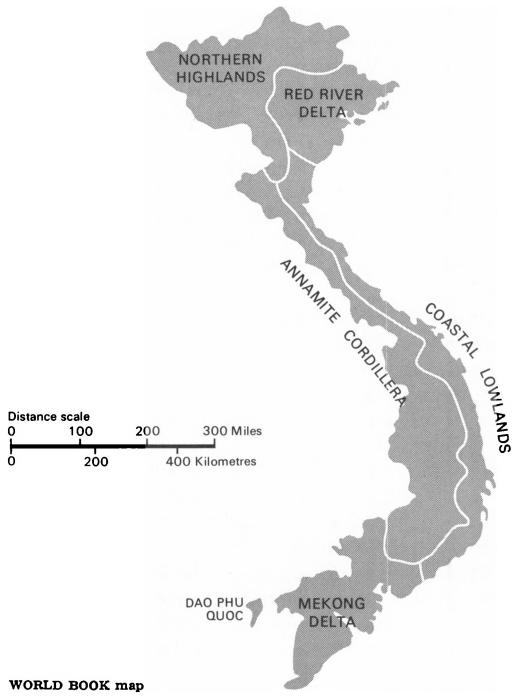
Vietnam has five main land regions: (1) the Northern Highlands, (2) the Red River Delta, (3) the Annamite Cordillera, (4) the Coastal Lowlands, and (5) the Mekong Delta.

The Northern Highlands are a mountainous region that covers northwestern North Vietnam. The highlands extend into China and Laos. Forests or jungles cover most of the mountains in this thinly populated region. The highest peak in Vietnam, Fan Si Pan, rises 10,312 feet (3,143 meters) above sea level in the Northern Highlands.

The Red River Delta extends from the Northern Highlands to the Gulf of Tonkin. It has been formed by the Red River, which flows from southeastern China through North Vietnam into the gulf. Most of the delta lies 10 feet (3 meters) or less above sea level. The Red River floods much of this densely populated region almost every year. The Red River Delta is North Vietnam's chief farming area.

LAND REGIONS OF VIETNAM

The map below shows the five natural land regions of Vietnam: the Northern Highlands, the Red River Delta, the Annamite Cordillera, the Coastal Lowlands, and the Mekong Delta.



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*Population of metropolitan area, including suburbs.
*Does not appear on map; key shows general location.

Sources: Latest census (1960) for North Vietnam; latest official estimates (1970) for South Vietnam.

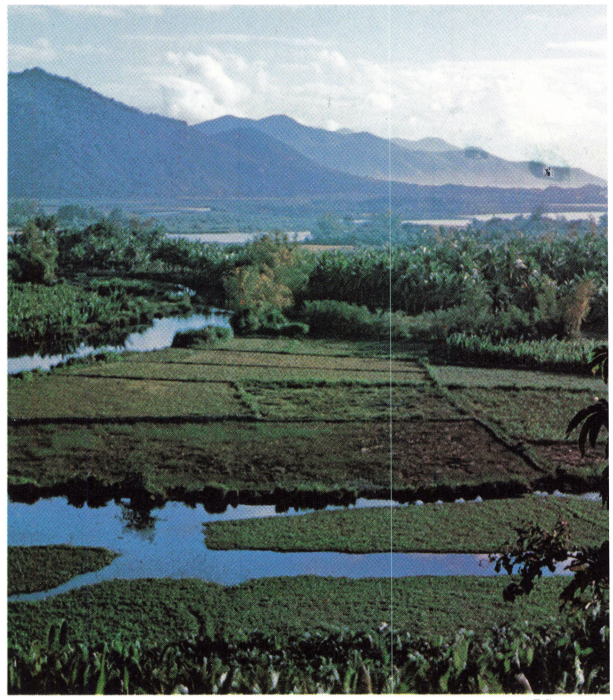
Specially created for **World Book Encyclopedia** by Rand McNally and World Book editors

The Annamite Cordillera is a chain of mountains. It runs through western Vietnam from the Northern Highlands to about 50 miles (80 kilometers) north of Saigon. Forests cover most of the mountains. Like the highlands, these mountains are thinly populated. Most of the people in this region are Montagnards.

The Coastal Lowlands occupy east-central Vietnam. The lowlands slope from the mountains to the South China Sea and extend from the Red River Delta to the Mekong Delta. Rice is raised throughout most of the region. Many people who live along the coast are fishermen. The lowlands are almost as thickly populated as the Mekong and Red river deltas.

The Mekong Delta covers all of South Vietnam south of the Annamite Cordillera and the Coastal Lowlands. It has been formed by the Mekong River, which flows from China through Southeast Asia into the South China Sea. The Mekong Delta, like the Red River Delta, lies 10 feet (3 meters) or less above sea level, and much of it is flooded every year. Over half the people of South Vietnam live on the delta. It is the chief agricultural area of all Vietnam. See MEKONG RIVER.

Animal Life. Many kinds of wild animals live in Vietnam. Boars, deer, elephants, goats, leopards, rabbits, and tigers live in the forests, and monkeys live in the coastal areas. Both water birds and land birds can be seen in many parts of Vietnam, and snakes live throughout the country. Large quantities of fish are found in the rivers and coastal waters. Many farmers use water buffaloes and other types of oxen to pull plows through their rice fields.



FPG

The Coastal Lowlands extend along much of Vietnam's seacoast. A chain of mountains called the Annamite Cordillera rises in the background along the western edge of the lowlands.

VIETNAM/*Climate*

Vietnam has a tropical climate. *Monsoons* (seasonal winds) affect the weather throughout the year. The summer monsoon brings heavy rain from the southwest. The winter monsoon brings lighter rainfall from the northeast. Most of Vietnam has two seasons—a wet, hot summer and a drier, cooler winter. Some areas of northernmost Vietnam have four seasons.

North Vietnam has damp weather from November to April. The average January temperature in Hanoi is about 63° F. (17° C). From May to October, the Red River Delta has high temperatures, heavy rains, and some typhoons, which sweep across the Gulf of Tonkin. The average June temperature in Hanoi is about 85° F. (29° C). Hanoi receives about 72 inches (183 centimeters) of rainfall a year.

In South Vietnam, the humidity remains high throughout the year. Most rain falls in summer. The Saigon area receives about 80 inches (200 centimeters) of rain between April and November. From December through March, the weather is cooler with little rain. The temperature in Saigon ranges from about 79° F. (26° C) in December to 85° F. (29° C) in April.

Most of central Vietnam is drier and cooler than the northern and southern regions. Mountain areas throughout Vietnam generally have lower temperatures and more rainfall than the deltas and the Coastal Lowlands.

Bill Strode, Black Star

The Summer Monsoon is a wind from the southwest that brings heavy rain to Vietnam each summer. It causes floods in Saigon, above, and throughout much of the rest of Vietnam.

The economy of Vietnam depends on agriculture. About two-thirds of the people are farmers, and farm products—especially rice—are the chief products.

The North has most of Vietnam's natural resources. *Anthracite* (hard coal) is the chief mineral resource, and North Vietnam has almost all the anthracite fields. Other mineral deposits in the North include gold, iron ore, lead, limestone, phosphates, tin, tungsten, and zinc. Among the mineral deposits in South Vietnam are gold, limestone, phosphates, and soft coal. Forest products of both North and South Vietnam include bamboo, cinnamon, quinine, and timber.

Agriculture. About 15 per cent of the land in North Vietnam and about 20 per cent of the land in South Vietnam is used for farming. About another 20 per cent of the land in the South is suitable for growing crops, but is not used.

Rice ranks as the chief crop in both North and South Vietnam. But the North has never produced enough rice to feed its people, and it has had to import food. South Vietnam ranked among the world's leading rice-growing countries before the Vietnam War reduced rice production. In the 1960's and 1970's, the South—like the North—had to import food.

In addition to rice, North Vietnamese farmers grow corn, cotton, sweet potatoes, and a tropical plant called *cassava*. South Vietnam crops other than rice include cassava, coffee, coconuts, sugar cane, tea, tobacco, and rubber.

Agriculture in North Vietnam is organized into large collective farms controlled by the government. The

Carl Purcell

Textile Manufacturing ranks as one of Vietnam's most important industries. The textile plant shown above is in the Saigon area of South Vietnam.

Richard N. Fawcett, FPG

The Streets of Saigon, South Vietnam's chief commercial center, are usually crowded with people. The woman carries cooked food that she sells to passers-by. Many people in the city ride motor scooters or hire pedicabs, *right center,* which are taxicabs operated like a bicycle.

farmers are paid according to the amount of work they do. The North Vietnamese government discourages the private sale of crops by farmers.

Agriculture in South Vietnam is based on small, private farms owned by the families who till them. But the 1975 Communist take-over may result in the end of private ownership of farms in South Vietnam.

Manufacturing. North Vietnam has a small iron and steel industry. The North Vietnamese use the iron and steel to manufacture agricultural tools, bicycles, and simple machinery. North and South Vietnam have cement, food-processing, paper, and textile industries.

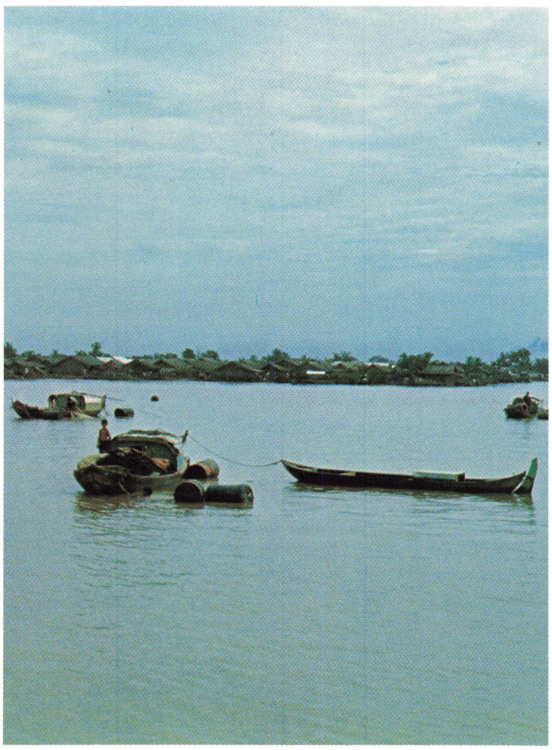
Vietnam has never been a major manufacturing center. Since 1954, foreign nations have supplied much aid to Vietnam to promote industrial growth. China, Russia, and nations of Eastern Europe supplied aid to North Vietnam. The United States, Australia, and Western European nations aided the South. But Vietnam lacks the natural resources needed for large-scale industry. Also, the Vietnam War made it difficult for Vietnam to develop its industries.

Foreign Trade. Since the 1960's, both North Vietnam and South Vietnam have imported much more than they exported. Both countries received large amounts of food, machinery, military supplies, petroleum, and vehicles. Rubber from South Vietnam has been the only major Vietnamese export in recent years.

China and Russia rank as North Vietnam's chief trading partners. Japan, Taiwan, and the United States were South Vietnam's main partners before the Communist take-over.

Marc Riboud, Magnum

Hanoi, North Vietnam's chief industrial center, was threatened by U.S. air attack during the Vietnam War. The bombing forced many factories to move to rural areas. The round objects in the sidewalk, *above,* cover air-raid shelters.



Paul J. Quirico, Tom Stack & Assoc.

Vietnam's Rivers serve as important transportation routes and also yield large quantities of fish. The fishing boats above are on a branch of the Mekong River in South Vietnam.

Transportation and Communication. Vietnam has an excellent transportation system. The system includes about 20,000 miles of roads and 2,000 miles of railroad tracks. During the Vietnam War, the roads and railroads were well maintained and greatly expanded to carry military traffic. The Red River and its branches in the North, and the Mekong and its branches in the South, are important waterways in Vietnam.

The bicycle ranks as the chief means of private transportation in North Vietnam. The bicycle is also important in the South, but motor scooters are also widely used there.

Many newspapers are published in both North and South Vietnam. Before the 1960's, few Vietnamese owned a radio or a TV set. In the 1960's and 1970's, ownership of radios—and to a lesser extent television sets—became fairly widespread in South Vietnam. In North Vietnam, relatively few people own either a radio or TV set. Most people listen to radio programs over public loudspeakers. Most of the country's television sets are owned by collective farms, workers' organizations, or similar groups.

North Vietnam's Lao Dong Party has censored all means of communication since it came to power. It does so in order to promote loyalty to the party. Before 1975, communications operated more freely in South Vietnam. But sometimes—especially during the Vietnam War—the government of the South censored the news. After the Communists took over South Vietnam, they imposed censorship on communications, as they had done in the North.

Early Years. In ancient times, the Vietnamese people lived in what is now North Vietnam. About 200 B.C., a Chinese general named Chao T'o united the area and parts of southeastern China into an independent kingdom called *Nam Viet*. It extended almost as far south as the present city of Hue. In 111 B.C., China conquered Nam Viet and renamed it *Chiao Chih*. In A.D. 679, the Chinese changed the name of Chiao Chih to *Annam*.

By the end of the A.D. 100's, two kingdoms—Funan and Champa—had developed in what is now South Vietnam. Funan ruled the Mekong Delta and what is now southern Cambodia. Champa controlled the area between Chiao Chih (Annam) and Funan in what now is central Vietnam. During the 500's and 600's, Khmer people living to the west of Champa conquered Funan. They built a mighty empire during the next few hundred years.

Independence. In 939, the Chinese left Annam, and the Vietnamese established an independent state. It remained independent for more than 900 years, except for a 20-year period of Chinese control in the early 1400's. During those 900 years, the Vietnamese gradually built a small empire.

In 1009, the Ly family came to power in Annam. The family ruled the country for more than 200 years. The Ly rulers built a strong army that repeatedly defeated attacking forces from Champa and from the Khmer empire. In 1054, the Vietnamese emperor changed the name of Annam to *Dai Viet*. But for hundreds of years, both of these names were used for the country.

The Tran family seized power from the Ly rulers in 1225 and governed the country until 1400. During that period, Dai Viet defeated several attacking Mongol armies and fought almost continuously with Champa. China regained control of Dai Viet in 1407. The Vietnamese drove out the Chinese in 1427, and the Le family, which had led the fight against China, came to power. They held the throne until 1787.

In 1471, Le Thanh Ton, the strongest of the Le rulers, conquered Champa. But weak rulers followed Le Thanh Ton, and civil war broke out in Dai Viet during the early 1500's. The war began as two families—the Trinh in the north and the Nguyen in the south—fought for control of the country. Both sides claimed to support the Le rulers. The families finally stopped fighting in 1673, and Dai Viet had peace for about 100 years. During that time, the Nguyen family expanded their territory by seizing parts of the Khmer empire.

In the early 1770's, three brothers in southern Dai Viet led a revolt against the Nguyen family. The brothers called themselves *Tay Son* after the name of their home village. The Tay Son conquered southern Dai Viet and then marched against the Trinh family in the north. In 1787, the brothers conquered the north and removed the Le rulers.

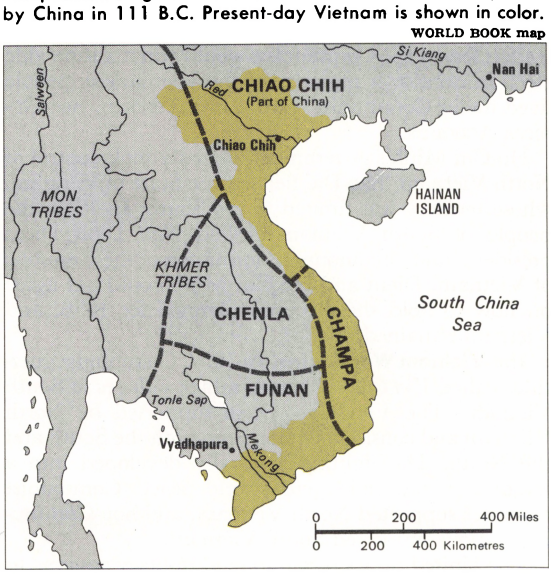
The youngest Tay Son brother became ruler of northern and central Dai Viet. But Nguyen Anh, a member of the defeated Nguyen family, gained control of southern Dai Viet. In 1802, he defeated the Tay Son ruler and declared himself Emperor Gia Long of all Dai Viet, which he renamed *Vietnam*. Members of the Nguyen family remained the emperors of Vietnam until the end of World War II in 1945. But they had little power after the mid-1800's.

French Rule. Roman Catholic missionaries from France began to arrive in Dai Viet in the 1600's. They converted thousands of Vietnamese to Catholicism, but the country's rulers became suspicious of the missionaries. From the 1600's through the early 1800's, Viet-

THE INDOCHINA PENINSULA ABOUT A.D. 300

This map shows the early states of Indochina. Chiao Chih was an independent kingdom called *Nam Viet* before it was conquered by China in 111 B.C. Present-day Vietnam is shown in color.

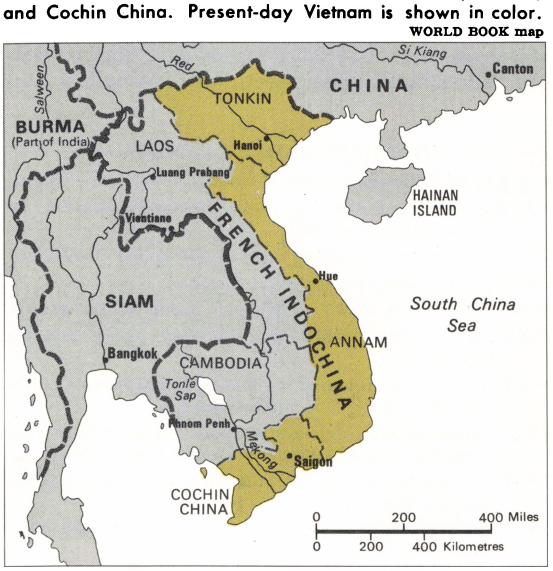
WORLD BOOK map



THE INDOCHINA PENINSULA IN 1900

This map shows French Indochina, which included Cambodia, Laos and Vietnam. France divided Vietnam into Tonkin, Annam, and Cochin China. Present-day Vietnam is shown in color.

WORLD BOOK map



namese rulers continually persecuted the missionaries.

In 1858, French forces began to attack parts of southern Vietnam. France acted partly to stop the persecution of the missionaries and partly because it wanted to become a colonial power in Vietnam. The French seized Saigon in 1861 and the rest of southern Vietnam by 1867. They took control of northern Vietnam by 1883. That year, the French forced the Nguyen ruler to sign a treaty that gave France control of all Vietnam. France divided the country into three areas—*Cochin China* (southern Vietnam), *Annam* (central Vietnam), and *Tonkin* (northern Vietnam). France governed the areas as separate parts of French Indochina, which also included Cambodia and Laos.

Japanese Control. Germany defeated France early in World War II, in June, 1940. Japan, one of Germany's allies, then took control of French Indochina. The Japanese allowed French officials to remain in Vietnam, but they had to govern according to Japan's wishes. Then, in March, 1945, the Japanese arrested all French officials and forced Emperor Bao Dai to announce the independence of Annam and Tonkin from France. Vietnam remained under Japanese control until Japan's defeat in August, 1945.

The Indochina War. Ho Chi Minh, a Vietnamese Communist, arrived in Hanoi from China a few days after Japan's defeat. He headed the Revolutionary League for the Independence of Vietnam, commonly called the *Vietminh*. The Vietminh quickly gained control over most of northern Vietnam. They forced Bao Dai to step down as ruler in favor of Ho Chi Minh, who announced formation of the Democratic Republic of Vietnam (DRV) on September 2.

In March, 1946, France officially reorganized the DRV as the government of Annam and Tonkin. In June, the French approved formation of the Republic of Cochin China by non-Communist Vietnamese leaders. Relations between France and the Vietminh gradually worsened. On Dec. 19, 1946, the Vietminh attacked French forces throughout Vietnam, and the Indochina War began. Starting in 1949, France and other Western powers supported Bao Dai as leader of the State of Vietnam. Its capital was Saigon. Communist nations supported the government of Ho Chi Minh. Each government claimed to represent all Vietnam. In 1953, the Communists began to take control of the farmland in North Vietnam. They killed or imprisoned landowners they considered enemies of the Communist effort. They also assigned production quotas to all other farmers.

IMPORTANT DATES IN VIETNAM

111 B.C. The Chinese conquered what is now North Vietnam.

A.D. 939 China ended its rule over the Vietnamese, who then set up an independent state.

1802 Nguyen Anh united the country and called it *Vietnam*.

1858-1883 France took control of Vietnam.

1940-1945 Japan controlled Vietnam during World War II.

1946 The Indochina War began between France and the Vietminh.

1954 The Vietminh defeated the French. The Geneva Conference divided Vietnam into two nations.

1957 Communist terrorists began to attack villages in South Vietnam. The fighting developed into the Vietnam War.

1973 A cease-fire agreement ended U.S. participation in the Vietnam War.

1975 The Vietnam War ended on April 30, when South Vietnam surrendered to the Communists.

Keystone

Refugees of the Indochina War (1946-1954) left their homes in northern Vietnam as the Communists took control of the region. At the war's end, Vietnam was divided into two zones—the Communist North and the non-Communist South.

The Division of Vietnam. In April, 1954, representatives of the DRV, the State of Vietnam, Cambodia, Laos, China, France, Great Britain, Russia, and the United States met in Geneva, Switzerland, to arrange a peace settlement for Vietnam. In May, the Indochina War ended with the defeat of French forces at Dien Bien Phu. The representatives at the Geneva Conference then decided to divide Vietnam temporarily into two parts. The conference also called for elections in 1956 to unite Vietnam under one government. But the State of Vietnam felt that fair elections could not be held. Its leaders feared the Communists would win a nationwide election because a majority of the Vietnamese people lived under Communist control in the North. See GENEVA ACCORDS.

Ho Chi Minh's government officially took control of North Vietnam. Bao Dai headed the State of Vietnam, whose territory was limited to the South. In 1955, the people of South Vietnam elected Ngo Dinh Diem president, and he announced formation of the Republic of Vietnam. Diem and Ho Chi Minh could not agree on how to hold the elections planned for 1956, and Vietnam remained divided.

The Vietnam War Begins. In 1957, Communist guerrillas called *Viet Cong* began to attack villages in South Vietnam. The Viet Cong were supported by North Vietnam and consisted of men from both the South and the North. The fighting gradually developed into a major war that endangered world peace. Communist countries supported North Vietnam, and non-Communist nations supported South Vietnam.

The United States began to send military advisers to

South Vietnam in the 1950's. From 1965 to the early 1970's, the United States sent combat troops to Vietnam. The U.S. Air Force carried out widespread bombing of the North.

South Vietnam and the War. President Diem signed a new constitution into law in 1956. It declared that South Vietnam was a republic. But Diem and his family actually controlled the government.

Viet Cong attacks in South Vietnam increased during the late 1950's and early 1960's. Diem turned more and more to undemocratic policies to combat the Communists, and South Vietnamese political leaders began to criticize the Diem government. In 1962, Diem declared a national emergency. He established a curfew, the censorship of news, and other restrictions. Criticism of the Diem government increased during 1963.

On Nov. 1, 1963, a group of army generals led by Duong Van Minh seized the South Vietnamese government. Diem was murdered. A series of military groups held power for brief periods until June, 1965. A group led by Nguyen Cao Ky, an air force general, then took control. Ky's government put down a Buddhist-led uprising in 1966. That same year, South Vietnamese voters elected an assembly of representatives to write a new constitution. In 1967, Nguyen Van Thieu, an army general, was elected president under the new constitution. Ky was elected vice-president. Meanwhile, the Vietnam War grew into a major conflict and fierce battles raged in South Vietnam.

In 1971, Thieu was re-elected president, and former Premier Tran Van Huong became vice-president. The election drew criticism from many other countries because Thieu ran unopposed. General Minh entered the race for president but withdrew before the election. He claimed that Thieu had fixed the election, making it impossible for any candidate opposing Thieu to win.

In June, 1972, the National Assembly gave Thieu power to rule by *decree* (presidential order) for six months. In August, Thieu ruled that almost all hamlet and village officials would no longer be elected but would be appointed by the national government. This decree brought an end to almost all local elections in South Vietnam.

North Vietnam and the War. After the Geneva settlement in 1954, the Communist government began to organize the land into collective farms. At the same time, it began to take control of North Vietnam's industries. This takeover continued during the late 1950's.

During the 1960's and early 1970's, North Vietnam concentrated more and more of its agricultural and industrial efforts in support of the war. United States air raids during the late 1960's and early 1970's forced many industries to move to the countryside.

Ho Chi Minh served as North Vietnam's president until he died in 1969. Vice-President Ton Duc Thang succeeded him, but the Politburo of the Lao Dong Party actually controls the government.

The Fall of South Vietnam. After 1965, South Vietnam depended more and more on American support in its war against the Communists. Beginning in the late 1960's, American involvement in Vietnam became increasingly unpopular in the United States. In January, 1973, South Vietnam, the United States, and the Communists signed a cease-fire agreement. Later in the year, the United States removed its last combat troops from Vietnam.

But the Communists soon launched another offensive against South Vietnam. On April 30, 1975, Saigon fell to the Communists, and the Communists gained control of South Vietnam. For more details on the conflict, see VIETNAM WAR.

The Communists set up a Provisional Revolutionary Government to rule South Vietnam. At the same time, however, North Vietnamese leaders claimed that North and South Vietnam had been, in effect, unified into a single Communist nation.

DENNIS J. DUNCANSON

VIETNAM / *Study Aids*

Related Articles in WORLD BOOK include:

Clothing (picture: Traditional Costumes)
Colombo Plan
Da Nang
Geneva Accords
Haiphong
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Indochina
Mekong River
Mongol Empire
Ngo Dinh Diem
Nguyen Van Thieu
Pham Van Dong
Saigon
Southeast Asia
Southeast Asia Treaty Organization
Vietnam War

Outline

I. Government
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- D. Housing
- E. Food
- F. Language
- G. Education
- H. Religion
- I. The Arts

III. The Land
- A. The Northern Highlands
- B. The Red River Delta
- C. The Annamite Cordillera
- D. The Coastal Lowlands
- E. The Mekong Delta
- F. Animal Life

IV. Climate

V. Economy
- A. Agriculture
- B. Manufacturing
- C. Foreign Trade
- D. Transportation and Communication

VI. History

Questions

When was Vietnam divided into two nations?
What is the chief religion of Vietnam?
What river has built up a large delta in South Vietnam? In North Vietnam?
What country controlled Vietnam during World War II?
How has the Vietnamese way of life changed since the late 1800's?
In what ways does the Lao Dong Party control the government of North Vietnam?
What is the chief crop of Vietnam?
What are the largest minority groups in Vietnam?
When did China control Vietnam? When did France?
How do monsoons affect the weather in Vietnam?

VIETNAM WAR began in 1957 when forces supported by Communist North Vietnam began attacking the government and its officials in South Vietnam. For the first few years, these forces consisted of guerrillas and terrorists commonly called the *Viet Cong* or *VC*. Viet Cong is a shortened form of the words *Viet Congsan*, meaning *Vietnamese Communists*. Most of the Viet Cong's officers had been trained in North Vietnam and had later been sent secretly back into South Vietnam.

The Viet Cong were opposed by the South Vietnamese Army (ARVN). The ARVN received military and economic aid from the United States, including assistance from American advisers. In 1965, combat units of the U.S. Army, Navy, Marines, Air Force, and Coast Guard began to take part. Smaller units were sent from South Korea, Australia, New Zealand, and Thailand. On the Communist side, the Viet Cong were joined by regular units of the North Vietnam People's Army (PAVN). Russia and China supplied the Communists with war materials but not troops.

The Communists called the struggle in Vietnam a *war of national liberation*. They accused the South Vietnamese government of being a "puppet" of the United States and pledged to overthrow the government. They wanted to unite Vietnam under one rule.

The fighting in South Vietnam started on a small scale. In time, it grew into a savage, full-scale war that threatened world peace. There was no fixed *front* (battle line). The Communists used guerrilla tactics, including ambushes and hand-laid bombs and mines (see GUERRILLA WARFARE). Non-Communist forces conducted air raids and "search and destroy" operations in which troops were transported by helicopters.

The United States never officially declared war. But the number of American troops in South Vietnam reached a peak of more than 543,000 in February, 1969. At the same time, there were more than 800,000 South Vietnamese and about 68,000 other non-Communist forces fighting an estimated 240,000 Communist guerrillas and regular troops. About 82,000 of the Communist forces were regular PAVN soldiers. Later in 1969, the United States began limited troop withdrawals. American withdrawals continued during the early 1970's, and the South Vietnamese began to take more responsibility in carrying on the war. In January, 1973, a cease-fire agreement was signed by the United States, North and South Vietnam, and the Viet Cong. The cease-fire ended U.S. involvement in the war. However, North Vietnam, South Vietnam, and the Viet Cong violated the agreement and continued to fight. The war ended on April 30, 1975, when South Vietnam surrendered to the Communists.

The United States and the War

U.S. participation in the Vietnam War became one of the most divisive foreign policy issues in United States history. Americans disagreed on both the objectives and the strategy of U.S. involvement. The war became increasingly unpopular as casualties increased and chances for victory appeared to decrease. See JOHNSON, LYNDON B. (The Widening Vietnam War); NIXON, RICHARD M. (Foreign Policy; Foreign Affairs).

Some Americans believed U.S. participation was necessary to stop Communist aggression and to maintain U.S. honor and prestige. They argued that a Communist victory in South Vietnam would lead to Communist take-overs elsewhere. Some government leaders believed that the loss of South Vietnam to the Communists would mean all of Southeast Asia would fall to Communism "like a set of dominoes."

Other Americans believed that the conflict in Vietnam was a civil war in which the United States should not have become involved. Some maintained that U.S. security was not at stake and that the nation should not try to be a "world policeman." Others claimed that the U.S. armed forces were supporting a corrupt, undemocratic government in South Vietnam, and that the war was draining money away from vital U.S. domestic programs. Still others opposed the war because it resulted in hundreds of thousands of military and civilian casualties and left large areas of Vietnam in ruin.

Some military experts called for more U.S. military pressure. They argued that the Communists would give in only if the war were carried to North Vietnam by bombing or other means. Others disagreed, and wanted

The Vietnam War was fought mainly in North and South Vietnam. Troops also battled along the Ho Chi Minh Trail in Laos and Cambodia or flew missions from bases in Thailand.

Henry Gill

Non-Communist Forces battled in the air and on the ground to keep South Vietnam free of Communist control. Helicopters played an important part in the war. Pilots used them to transport troops and to seek out Viet Cong guerrillas in the forests and mountains. Helicopters carried the wounded to hospitals and brought food, ammunition, and medical supplies to field troops.

more emphasis placed on counter-guerrilla methods in South Vietnam. They also stressed programs of political, social, and economic reform to win the allegiance of the South Vietnamese. Some also feared U.S. bombing would bring China into the war.

Background of the War

The Indochina War. Before World War II, Vietnam was a part of French Indochina, which also included Cambodia and Laos (see INDOCHINA). During World War II, Japan occupied Indochina, but much of the area came under French control again after the war. Ho Chi Minh, Communist leader of the League for the Independence of Vietnam (Vietminh), became head of an independent government in northern Vietnam.

Disagreements soon arose between France and Ho Chi Minh. Fighting broke out on Dec. 19, 1946, and continued for eight years. The French were defeated in May, 1954, at Dien Bien Phu, and a peace agreement was arranged. A nine-nation conference meeting in Geneva, Switzerland, ended the war in Laos and Cambodia and divided Vietnam. The area in Vietnam north of the 17th parallel was controlled by Communists led by Ho Chi Minh. It became known as the Democratic Republic of Vietnam. The territory south of the parallel became the Republic of Vietnam after

Henry Gill

Emperor Bao Dai was deposed in 1955. It was then ruled by President Ngo Dinh Diem, who had U.S. backing. The United States and South Vietnam did not sign the Geneva *accords* (agreements), but they announced their intentions to abide by them. See GENEVA ACCORDS.

The Geneva accords provided that the country must be reunified in 1956 through an election supervised by an international commission. But Diem refused to hold the election. Diem argued that free elections were impossible, because North Vietnam would not permit pre-election campaigning in its territory. He feared that the popular Ho Chi Minh would therefore receive most of the votes in the north, and the Communists would gain control of a united Vietnam.

The Early U.S. Role. In the early 1950's, the United States sent military supplies and advisers to French troops in Vietnam before their defeat. Following the 1954 Geneva agreements, President Dwight D. Eisen-

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hower pledged American support to the South Vietnamese. This support helped rehabilitate the country.

Diem stayed in power largely because of U.S. support. But his neglect of the peasants and the favoritism he showed his own family, particularly his brother Ngo Dinh Nhu, made him increasingly unpopular. In 1956, Diem ended local elections and appointed his own village officials. Popular feeling against him mounted.

History of the War

The Viet Cong Raids began in early 1957. Guerrillas began to attack farm villages, particularly in the Mekong Delta. The Viet Cong guerrillas were under Communist control, but many of them were not Communist Party members. They fought against the South Vietnamese government because of its repressive measures and its failure to provide the people with the necessities of life. Some of the toughest Viet Cong had been fighting for about 20 years, first against Japan, then France, and finally against the Diem government.

By 1960, the Viet Cong had about 20,000 men. They were outnumbered by the South Vietnamese Army ten to one, but were strong enough to attack South Vietnamese forts and army units. They used guerrilla tactics, striking here and there unexpectedly. South Vietnamese troops tried to protect the entire country but failed.

The National Liberation Front (NLF), a political group, was organized in Hanoi in December, 1960, to support the Viet Cong. The NLF set up local councils to govern areas of South Vietnam controlled by the Viet Cong, built factories to manufacture weapons, and supplied ammunition, medical supplies, and money to the Viet Cong. Many of the VC's supplies and troops came from North Vietnam, chiefly over a system of roads and trails known as the *Ho Chi Minh Trail.*

By 1961, the Viet Cong had become so successful in South Vietnam that the U.S. was forced to choose between allowing the collapse of the South Vietnamese government and increasing its support. At that time, the United States had about 750 military advisers in South Vietnam. President John F. Kennedy ordered a step-up in military aid, including the increase of American advisers, technicians, pilots, and planes. By February, 1962, about 2,700 U.S. advisers had arrived. By November, 1963—when Kennedy was assassinated—there were about 16,300 U.S. military men in South Vietnam.

The Buddhist Crisis in 1963 heightened South Vietnam's internal troubles. The Buddhists claimed that Diem, a Roman Catholic, was treating them unjustly because of their religious beliefs. Some Buddhist monks burned themselves to death as a sign of protest. When special forces under Nhu raided and wrecked some Buddhist *pagodas* (temples), dissatisfaction with the Diem government spread. The United States criticized the Diem government and suspended certain types of economic aid to South Vietnam.

The South Vietnamese generals, encouraged by United States disapproval of Nhu's action, overthrew the Diem government on Nov. 1, 1963. Diem and his brother Nhu were killed the next day. A series of short-lived regimes governed South Vietnam until a military *junta* (committee) headed by Air Force Commander Nguyen Cao Ky came to power in June, 1965.

IMPORTANT DATES IN THE VIETNAM WAR

1957 The Viet Cong began to attack the South Vietnamese government headed by President Ngo Dinh Diem.
1963 (June) Buddhists in South Vietnam began large-scale demonstrations against the Diem government.
1963 (Nov. 1) South Vietnamese generals overthrew the Diem government, and Diem was killed the next day.
1964 (Aug. 7) The U.S. Congress passed the Gulf of Tonkin resolution, which gave the President power "to take all necessary measures to repel any armed attack against the forces of the United States and to prevent further aggression."
1965 (Feb. 7) President Lyndon B. Johnson ordered U.S. pilots to bomb military targets in North Vietnam.
1965 (March 6) President Johnson sent U.S. Marines to Da Nang, South Vietnam, to protect American bases there. The Marines were the first U.S. ground troops in the war.
1967 (Sept. 3) South Vietnam held the first elections under its new constitution, adopted earlier that year. Nguyen Van Thieu was elected president.
1968 (Jan. 30) The Communists launched the Tet offensive, a large-scale attack against 30 South Vietnamese cities.
1968 (March 16) U.S. troops killed hundreds of South Vietnamese civilians in the village of My Lai. One officer, Lieutenant William L. Calley, Jr., was found guilty of murder by a U.S. court-martial.
1968 (May 13) Preliminary peace talks between the United States and North Vietnam began in Paris.
1969 (June 8) President Richard M. Nixon announced that U.S. troops would begin to withdraw from South Vietnam.
1970 (June 24) The Senate repealed the Gulf of Tonkin resolution.
1973 (Jan. 27) The United States, North and South Vietnam, and the Viet Cong signed a cease-fire agreement in Paris.
1973 (March 29) The last American troops left South Vietnam.
1975 (April 21) President Thieu resigned.
1975 (April 30) South Vietnam surrendered to the Communists.

The Gulf of Tonkin Incident. On July 30, 1964, South Vietnamese naval craft raided islands in the Gulf of Tonkin north of the 17th parallel. Two U.S. destroyers were patrolling nearby. North Vietnamese PT boats, probably while pursuing the South Vietnamese, attacked the destroyers. Two PT boats were sunk. U.S. planes then bombed the PT boat bases. This was the first U.S. attack on North Vietnamese territory.

After the Tonkin Gulf incident, President Lyndon B. Johnson asked Congress for powers "to take all necessary measures to repel any armed attack against the forces of the United States and to prevent further agression." Congress granted these powers by an overwhelming vote. Johnson used the resolution as a chief legal basis of U.S. support for South Vietnam in the war.

Escalation of the War. The war gradually grew in intensity. In late 1964, South Vietnamese morale was extremely low, and the United States began to consider bombing North Vietnam as a way of assisting. An attack on two U.S. camps at Pleiku in early 1965 triggered the decision. U.S. and South Vietnamese pilots then began bombing the infiltration routes and military installations in North Vietnam. For many years, the North Vietnamese had sent mostly former Southerners into South Vietnam. In late 1964, however, at least one North Vietnamese battalion was sent to South Vietnam. In midspring of 1965, following the bombing of North Vietnam, large numbers of North Vietnamese troops began arriving in South Vietnam.

In March, 1965, President Johnson ordered U.S. Marines into South Vietnam to protect American bases there. These were the first U.S. ground troops used in the war. But the Viet Cong strength continued to grow, and it became doubtful whether the South Vietnamese forces could hold out through the summer. In July, Johnson ordered a build-up of U.S. forces in South Vietnam. General William C. Westmoreland took command of all U.S. troops in South Vietnam.

Full-Scale Combat. In 1966 and 1967, the fighting in Vietnam increased. Both sides enlarged their fighting forces, and casualties rose. Meanwhile, South Vietnam tried to establish a representative form of government. In 1967, voters approved a new constitution and elected a president, vice-president, and legislature. Lieutenant General Nguyen Van Thieu was elected president, and Ky became vice-president.

In 1968, the Vietnam War became the longest war in which the United States had ever been involved. In January and February, 1968, the Communists launched large-scale attacks in South Vietnam, causing heavy damage and loss of life in Hue and Saigon. In one of the longest battles of the war, the Communists attacked the U.S. Marine base of Khe Sanh early in 1968. After a 77-day siege, the Communists withdrew. The Marines abandoned the base in mid-1968. In July, 1968, General Creighton W. Abrams replaced General Westmoreland as commander of U.S. forces in Vietnam.

The Bombing Halt. On March 31, 1968, President Johnson announced a halt in the bombing of most of North Vietnam. The United States and North Vietnam began formal talks in Paris in May. The talks were aimed at reducing the level of fighting and arranging a peace settlement. On November 1, the United States halted all bombing and other attacks on North Vietnamese territory. The South Vietnam government and the Viet Cong joined the Paris talks in January, 1969, but the negotiators made little progress.

Vietnamization. By March, 1969, more Americans had been killed in combat in the Vietnam War than in the Korean War. More and more Americans became impatient for the war to end. In June, President Nixon announced the first of several withdrawals of U.S. forces from Vietnam. He said American troops would be replaced by South Vietnamese forces, which were being strengthened in numbers and fighting ability. This policy became known as *Vietnamization.* But many people were still dissatisfied. Demonstrations for peace took place in the United States on October 15, called Moratorium Day. On November 15, about 300,000 persons held an antiwar protest in Washington, D.C.

In April, 1970, U.S. and South Vietnamese troops invaded Cambodia to attack the North Vietnamese supply depots there. Nixon said the action would save the lives of American troops in South Vietnam and shorten the war. But many people felt that Nixon was widening the war. Antiwar protests broke out on hundreds of college campuses in the United States. All U.S. troops were removed from Cambodia in June, 1970.

As U.S. troop withdrawals continued in 1970, the level of fighting fell sharply. But little progress was made at the Paris talks. In 1970, each side presented peace proposals which were rejected by the other side.

Early in 1971, South Vietnamese troops invaded Laos in an effort to cut the Ho Chi Minh Trail. U.S. forces provided air and artillery support. The South Vietnamese destroyed many enemy supplies, but they suffered heavy casualties and were forced to withdraw. Many U.S. planes were shot down. In 1971, the United States resumed the bombing of North Vietnam.

During 1971, both the United States and the Viet Cong presented new peace proposals. None of the plans was acceptable to the other side. Nixon announced in January, 1972, that Henry M. Kissinger, his special assistant for national security affairs, had held 12 secret meetings with North Vietnamese diplomats in Paris between August, 1969, and October, 1971.

On March 30, 1972, North Vietnam launched a major offensive in South Vietnam. South Vietnamese troops were forced to retreat at first and lost much ground. In May, Nixon ordered the mining of North Vietnamese harbors to cut off North Vietnam's war supplies from Russia and China. At the same time, the United States stepped up its bombing of rail and highway networks in North Vietnam. By the end of August, 1972, the Communist offensive had been halted.

U.S. troop withdrawals continued during 1972. Throughout the year, formal peace talks continued on and off in Paris. In addition, secret negotiations were resumed in Paris between Kissinger and North Vietnamese officials. In late October, Kissinger announced that "peace is at hand." But the talks broke down in December, and Nixon ordered full-scale bombing of the Hanoi-Haiphong area. After 12 days, the bombing was called off, and the secret talks were resumed.

The Cease-Fire. Finally, on January 27, 1973, a cease-fire agreement was signed in Paris by the United States, North Vietnam, South Vietnam, and the Viet Cong. The cease-fire was to be supervised by joint military commissions of the parties signing the agreement and by an International Commission of Control and Supervision. The agreement called for the withdrawal of all U.S. and allied forces from South Vietnam and the return of all prisoners—both within 60 days. It also

Wide World

The Vietnam War Ended when South Vietnamese troops, *left,* surrendered to the Communist forces, *right,* in Saigon.

called for the establishment of a National Council of Reconciliation and Concord to organize and carry out internationally supervised elections in South Vietnam. The first American prisoners of war were released on February 12. On March 2, the cease-fire agreement was endorsed by a 13-party conference in Paris. Participants in the conference included the foreign ministers of China, Russia, the United States, North and South Vietnam, and the Viet Cong. On March 29, the exchange of war prisoners was completed, and the last American troops left South Vietnam. However, North Vietnam, South Vietnam, and the Viet Cong violated the cease-fire agreement and continued to fight.

The End of the War came suddenly. South Vietnamese forces suffered a series of military setbacks in early 1975. By the end of March, they had lost about two-thirds of South Vietnam to the Communists. On April 21, President Thieu resigned. The war ended on April 30, when South Vietnam surrendered to the Communists. Two other Southeast Asian nations, Cambodia and Laos, also fell to the Communists in 1975.

About 56,800 U.S. troops died in the Vietnam War, including about 46,400 in combat. About 303,700 Americans were wounded and about 780 were missing. South Vietnam suffered about 254,300 troop deaths. North Vietnamese and Viet Cong troop deaths totaled about 1,027,100. ROGER HILSMAN

See also HO CHI MINH; NGO DINH DIEM; NGUYEN VAN THIEU; VIETNAM; WESTMORELAND, WILLIAM C. For a *Reading and Study Guide*, see *Vietnam War* in the RESEARCH GUIDE/INDEX, Volume 22.

VIGELAND, GUSTAV. See NORWAY (Arts; picture).

VIGILANTE, *VIJ uh LAN tee*, is a member of a self-appointed citizen group or vigilance committee. *Vigilante* comes from the Latin verb *vigilare* (to watch).

During pioneer days of United States history, the authorities often found themselves unable to enforce the laws. Sometimes the only law officer for many miles around was the United States marshal, and it was impossible for him to police all his territory. In these situations, the citizens frequently formed vigilance committees which dealt out swift punishment to persons they considered to be offenders. Sometimes innocent persons were punished. But often the vigilantes were the only force to preserve order in frontier territories. An early vigilance group was the San Francisco Vigilance Committee, formed in 1851. JOHN R. ALDEN

VIGNY, *vee NYEE*, **ALFRED DE** (1797-1863), a French author, was a leading figure in the romantic movement. He is best known for his lyric and descriptive poetry. From his *Poèmes antiques et modernes* (1826) to *Les Destinées* (1864), Vigny's main themes include the solitude of men of genius, the alienation of God from man, the search for greatness through suffering and resignation, and the nobility of thought as expressed in philosophical poetry. His other well-known works include the play *Chatterton* (1835), the novel *Cinq-Mars* (1826), and a collection of tales, *Military Service and Greatness* (1835).

Vigny was born in Loches. He spent much of his life living in isolation on his estate. An unhappy love affair with an actress and his failure to win political office intensified his sense of loneliness. JOEL A. HUNT

VIKING. See ROCKET (High-Altitude Rockets).

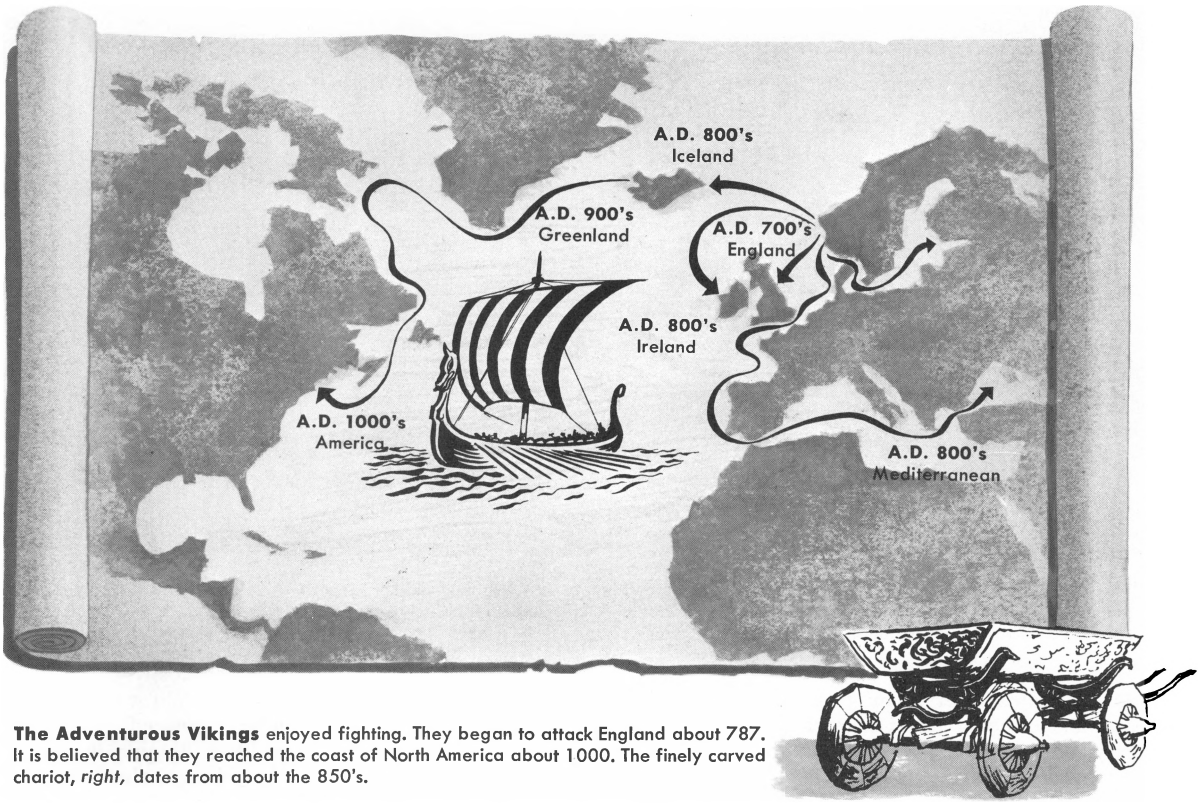
Culver

Viking Warriors terrified the people of Western Europe. The horned helmet, *above*, shows the skill of Viking craftsmen.

VIKINGS were daring Scandinavian sea rovers. They launched a series of successful raids on England, France, Germany, Ireland, Italy, and Spain between the late 700's and the late 1000's. The Vikings also explored and settled Greenland and Iceland. They tried to establish settlements in America, but did not succeed.

Vikings were also called Northmen, Norsemen, or Danes. They were a Nordic people, and were the ancestors of the Norwegians, Swedes, and Danes of today. They spoke a German dialect that resembled the language spoken in England at the time. The Vikings used the Runic alphabet (see RUNE).

The Vikings were an adventurous people who loved war and fighting. They were skillful and daring seamen. They were also the most efficient shipbuilders in Europe. Their swift, high-prowed ships carried raiding parties to most of the known world at that time and across the Atlantic to the unknown. The Vikings killed, stole, and burned wherever they landed. The churches of Europe offered a special prayer for help against the



The Adventurous Vikings enjoyed fighting. They began to attack England about 787. It is believed that they reached the coast of North America about 1000. The finely carved chariot, *right,* dates from about the 850's.

Vikings. It was "God, deliver us from the fury of the Northmen."

One of the major causes for the Viking invasions was the growth of population in their own countries, which increased the need for land and for other sources of income. Political conditions at home may have added to this restlessness. In addition, the Vikings were always a seafaring people, who lived near or on the shores of the sea. The term *viking* may have come from the old Norse word *vik*, meaning *bay* or *inlet*. It was easy for these people to take to their ships and seek fortunes elsewhere when the situation became serious at home.

Viking invasions were at first simply acts of piracy and plunder. But, in many cases, they led to important settlements. The Vikings strongly influenced the development of Europe for many years. The daring and imagination with which they roamed the seas gave rise to many colorful stories and poems, called *sagas*, about their deeds. But fiction can hardly surpass the amazing reality of Viking deeds.

Life of the Vikings

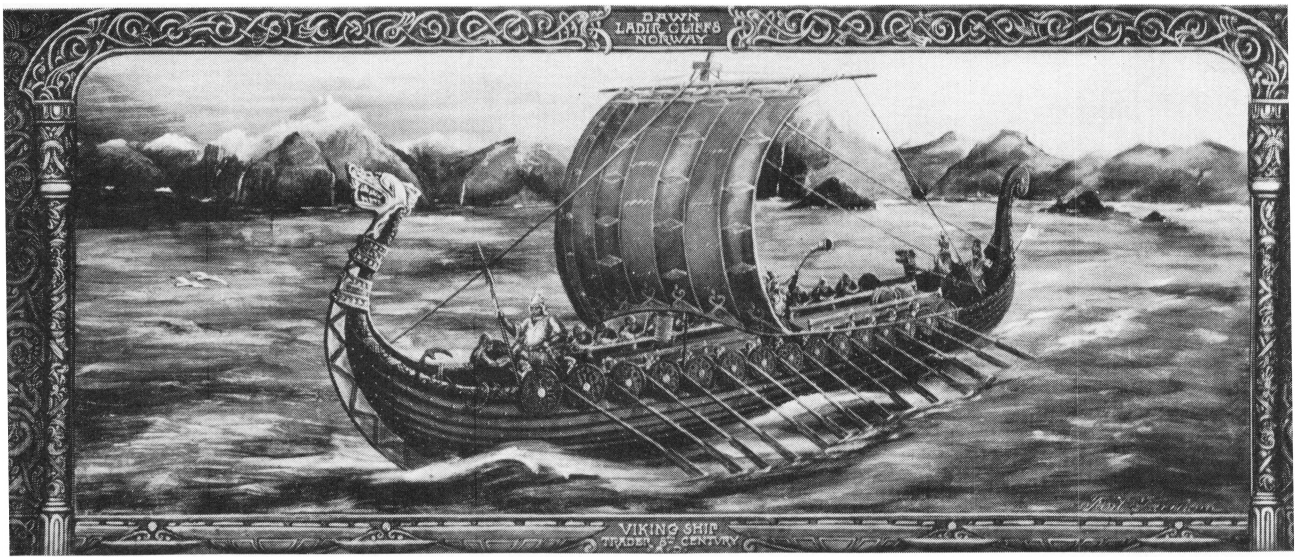
The Work of the People. The Vikings did not spend all their time at sea or in raiding. They planted crops in the spring before they set out on raids, and returned in the middle of summer to harvest them. Then they left home again, and did not return until winter.

During the winter, the Vikings spent their time at home preparing for next year's raids. They also enjoyed playing various games during the long, cold evenings. They played a game similar to chess, and various dice games. The king and the nobles often had special entertainment such as horse fights, performing dogs, music, or jugglers, for their guests.

Some of the Vikings worked in the cod, herring, and seal fisheries. Others made salt or tar. Two important occupations were the making of metal tools and weapons, and shipbuilding. The Vikings were amazingly skillful shipbuilders and navigators. They usually built small, shallow ships, about 70 feet (21 meters) long and 16 feet (5 meters) wide. But they did construct some ships that measured as long as 300 feet (91 meters). The ships were propelled by oars, with sometimes a single sail to help in maneuvering. The ships usually carried small crews of about 30 or 40 men. But they were so skillfully made and so daringly handled that the Vikings could go anywhere in them.

Characteristics. The ferocity of the Viking raiders terrified the people of Europe. Not only were they cruel, but also they carried on their raids with zest and efficiency. The Viking raiders struck swiftly and secretly. After hiding their boats, they pounced on their unsuspecting victims. The raiders had the upper hand before the invaded people knew what had happened. They killed, robbed, burned, and then escaped with such thorough preparation and with such speed that their victims had no opportunity even to try to punish them.

The Vikings seemed to go mad during the heat of battle. *Berserker*, their name for a warrior, has come to



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The Vikings Were Daring Explorers as well as fierce fighters. Although they did not know of the compass, the sextant, and other instruments of navigation, Viking raiders fearlessly sailed their small boats across great expanses of ocean.

be associated with insanity (see BERSERKER). These warriors seemed to enjoy destroying their victim's property, and went about it with horrible thoroughness. Fire was one of their favorite weapons. The Vikings were equally merciless in killing the defeated, slaying not only men but also women and children. They often raided religious centers, because these were good sources of booty, and were poorly defended.

Although the Vikings fought with savage cruelty, they had great courage. They enjoyed fighting, but they also loved adventure, as their amazing voyages show.

The qualities of intelligence and imagination that made the Vikings such good navigators helped them in other ways. They soon learned to find and steal the horses when they invaded a village or town. As they began to settle in the invaded areas, they became skillful horsemen. Some of the invaded people learned to protect themselves against the swift raids of the Vikings by surrounding their cities and towns with stout walls. But the Vikings quickly learned how to besiege and subdue walled towns. They also became masters in fortifying the places that they captured.

The Vikings learned rapidly from the more civilized people they attacked. For example, they quickly adopted the Christian religion. The Vikings originally worshiped the Norse gods, such as Odin and Thor (see MYTHOLOGY). In the 800's, Christian missionaries began to travel among them to preach their religion. Before long, many Vikings in Ireland, England, Normandy, and the Scandinavian countries became devout Christians.

As the Vikings became more civilized, they gave up their cruelty and their savage love of destruction. Another impressive sign of the Vikings' intelligence was their ability to shift from piracy to peaceful and productive commerce. It is true that the Viking pirates destroyed much. They disturbed the old way of life in medieval Europe. But this often permitted experimentation and the growth of new ideas. By quickly changing from pirates to traders, the Vikings helped develop commerce. The Viking invasions helped create a new Europe.

Viking Invasions

The Viking voyages and conquests include the searoving activities of the Swedes, Danes, and Norwegians. Medieval writers did not always distinguish carefully from what country their attackers came. They often used such terms as *Viking*, *Northman*, or *Dane* in a general way. But it is possible to discover what areas each of the different Scandinavian peoples invaded.

The Swedish Vikings raided along the rivers of Germany, and conquered the area that is now western Russia. Small bands of Swedish sailors, called *Varangians*, established themselves on the shores of the Baltic Sea, the Gulf of Finland, and Lake Ladoga in the 800's. From there, they sailed up the Volkhov River and crossed the Dnepr River.

The Varangians built forts that soon became towns and trading centers. Kiev was the capital of the Varangian state. The word *Russia* may come from the name of a Varangian tribe, called *Rus*, or *Rhos*.

The Varangians soon pushed south from their strongholds on the Dnepr River to the Black Sea, and from there to the Bosporus. They raided and pillaged the entire area. In the early 900's, they attacked Constantinople (now Istanbul). The Byzantine emperor had to pay a large sum of gold in order to save the city. The courage, daring, and skill of these raiders impressed the Byzantines, and the emperor set up a special Varangian guard for his personal protection. The Varangians were too few in number to maintain their identity over

so great a stretch of land. By the year 1000, they had merged completely with the surrounding Slavic peoples.

The Danish Vikings raided England, France, Spain, and areas along the coast of the Mediterranean Sea. Their travels covered most of Western Europe. They sailed up such great rivers as the Elbe, Garonne, Loire, Rhine, Rhône, Schelde, Seine, and Somme. Few of the larger towns in this area escaped their destructive raids. Many of them suffered repeated attacks. For example, the Danes destroyed Paris in 845 and 856. They besieged the city again in 885. This time, the Frankish emperor Charles the Fat paid the Danes to keep them from destroying it again. Many cities of Spain, including Seville, suffered from the attacks of the Danes.

These tireless raiders sailed through the Strait of Gibraltar into the Mediterranean Sea. They attacked Provence in southern France, the Balearic Islands, and Italy. The Danes also defeated the Moors in Morocco.

The Danes in England. The Danish raids on England began late in the 700's, and continued for more than 300 years. In the late 800's, a powerful Danish force established a base on English soil at York. The Danes marched from this base to conquer wherever they could. They were particularly successful in Northumbria, East Anglia, and the northern half of Mercia. The territory they controlled was called *the Danelaw*, and they forced the English to pay a tax, the *Danegeld*. The invaders met strong opposition from Alfred, king of Wessex. Alfred checked the forward progress of the invaders in 878. His success against the Danes is one reason for his title of "Great" (see ALFRED THE GREAT).

For a time, Alfred's successors continued to hold back the Danes. They even recaptured some territory. But new raiding parties attacked England in 980. Both Danes and Norwegians took part in these raids. Olaf Trygvasson, also called King Olaf I of Norway, joined King Sweyn Forkbeard of Denmark in the early 990's. These two Viking leaders had one success after another. They returned home in 995, but Sweyn resumed the attacks in 1003. His raiders swept through England.

In 1013, Ethelred, king of Wessex, fled the country and Sweyn became king of England. His son Canute, or Knut, succeeded him. Canute later became king of Denmark and Norway also. Under Canute, the Vikings held a huge empire and completely controlled the North Sea. After he died, they lost control of England.

The Danes in France. The Vikings who occupied and gave their name to Normandy in northern France were mostly Danes. Rollo, or Hrolf, led the Vikings in a long and bitter struggle with Charles the Simple, king of the West Franks. King Charles could not drive the invaders out, and they could not gain ground against the Franks. In 911, the invaders and the invaded reached an agreement. King Charles recognized Rollo as Duke of Normandy. Rollo became a Christian, and pledged his loyalty to the king. He also agreed to defend Normandy and help repel future invaders. The Danes of Normandy kept in touch with their homeland for a long time. Scandinavian influences still remain, particularly in the names of places and even in the clothes and customs of the Norman people. See NORMAN.

The Norwegian Vikings traveled to such areas as the Faeroe Islands, Greenland, the Hebrides, Iceland, Ireland, the Orkney Islands, Scotland, and *Vinland* (the mainland of North America). The influence of the Norwegians in Scotland and Ireland lasted throughout the Middle Ages. They founded the city of Dublin in about 840. It was the center of Viking power in Ireland for many years. See IRELAND (The Viking Raiders).

The exploration and settlement of Iceland and Greenland were more daring and colorful than any other Norwegian exploits during the Viking period. The literature of Iceland tells of these fearless sailors.

Some of the Icelandic sagas tell of Norwegian voyages to America. According to the sagas, Bjarni Herjulfsson was the first Viking to see North America, when a storm blew his ship off course. Herjulfsson did not land on this new territory. But Leif Ericson supposedly visited the land (see ERICSON, LEIF). He named it *Vinland* (see VINLAND). The sagas tell of trips from Greenland and Iceland to Vinland for about 12 years.

For many years, scientists tried to discover exactly where the Vikings established settlements in North America. In 1961, Norwegian archaeologists discovered the remains of a Viking settlement at L'Anse aux Meadows, near St. Lunaire, in northern Newfoundland. Many scientists accept the ruins as proof that Vikings lived there about A.D. 1000. Some believe the ruins may be from Ericson's settlement in Vinland. WILLIAM C. BARK

Related Articles in WORLD BOOK include:

Alfred the Great	Rune
Eric the Red	Saga
Ericson, Leif	Ship (Viking Ships)
Kensington Rune Stone	Sweden (picture: Picture Stones)
Norman	

See also *Vikings* in the RESEARCH GUIDE/INDEX, Volume 22, for a *Reading and Study Guide.*

Culver

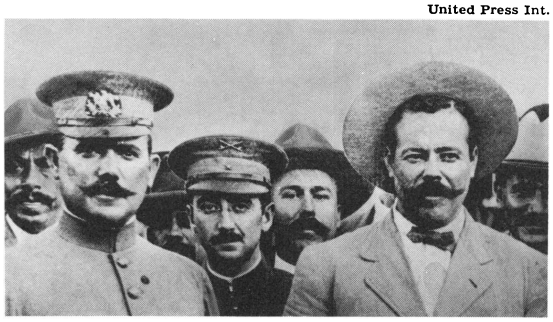
The Viking Chieftain Rollo sailed up the Seine River and attacked Paris in A.D. 845. Many Vikings settled in Normandy.

VILLA, *VEE yah,* **PANCHO** (1877-1923), was a Mexican bandit chieftain. He sought to control Mexico after the fall of President Porfírio Díaz in 1911. After the murder of President Francisco Madero in 1913, Victoriano Huerta became president. Villa supported him briefly. When Venustiano Carranza moved to gain control of Mexico in 1914, Villa attacked him. Álvaro Obregón defeated Villa and helped Carranza become acting chief of Mexico (see MEXICO [The Constitution of 1917]; OBREGÓN, ÁLVARO).

The United States encouraged Villa at first, but President Woodrow Wilson turned to Carranza because of reports of Villa's brutalities. Villa retaliated against Americans in Mexico, stopping trains and shooting those on board. In 1916, he raided Columbus, N.Mex. His cavalry attacked the town, killing 16 people. President Wilson sent U.S. soldiers under the command of General John J. Pershing into Mexico in pursuit of Villa. Hampered by orders not to use Mexican railroads, Pershing failed to capture Villa. All Mexicans, including President Carranza, bitterly resented Pershing's expedition. The expedition was withdrawn in 1917 (see WILSON, WOODROW [Crisis in Mexico]).

Obregón drove Carranza from power in 1920 and pacified Villa by a grant of land. Villa was shot from ambush by enemies in 1923. He was born Doroteo Arango in Río Grande, Zacatecas, Mexico. He changed his name to Francisco Villa, and was called Pancho Villa. DONALD E. WORCESTER

Pancho Villa, *right,* **and Álvaro Obregón are shown together at a meeting near El Paso, Tex., in 1914. They later became enemies.**
United Press Int.



VILLA-LOBOS, *VEE lah LOH boos,* **HEITOR** (1887-1959), was a Brazilian composer, conductor, and educator. His works were among the first serious music to use Brazilian folk and popular melodies, rhythms, and musical instruments. He composed symphonies, ballets, operas, and chamber music. Some of his most popular works are written in forms he invented called the *Bachiana Brasiliera* and *Chôros.*

Villa-Lobos was born in Rio de Janeiro, Brazil. In 1932, he became superintendent of musical education in Rio de Janeiro. DAVID EWEN

VILLA MARIA COLLEGE. See UNIVERSITIES AND COLLEGES (table).

VILLAGE is any small group or community of houses and dwellings. In local government, the term *village* has a more specific meaning. It refers to a community which the state has chartered as a municipality. Such a village is governed by a village president and a board of trustees. The village usually has its own clerk, treasurer, and police official. H. F. ALDERFER

See also CHARTER; LOCAL GOVERNMENT.

VILLANELLE. See POETRY (table: Terms).

VILLANOVA UNIVERSITY. See UNIVERSITIES AND COLLEGES (table).

VILLARD, OSWALD GARRISON (1872-1949), a staunch liberal, was editor of the New York *Evening Post* and then *The Nation.* In 1897, he joined the *Evening Post,* which his father had bought, together with the *Nation,* in 1881. He remained with the *Evening Post* until 1918, when financial difficulties, caused partly by his pacifist policies during World War I, forced him to sell the paper. He edited *The Nation,* a weekly journal of opinion, from 1918 to 1933, and continued to support liberal causes. Villard helped found the National Association for the Advancement of Colored People in 1909.

Born in Wiesbaden, Germany, he graduated from Harvard University in 1893. He was the grandson of the famous abolitionist William Lloyd Garrison. I. W. COLE

VILLEDA MORALES, RAMÓN. See HONDURAS (Recent Developments).

VILLEIN, *VIL in,* was an agricultural worker whose status was midway between that of freeman and slave during the Middle Ages in England. The villein was different from the slave because the villein's person was not the property of his master. He was different from the freeman because he was bound to a plot of land which was not his. In return for the use of this land and protection on it, the villein was required to render certain manual and other services to the lord of the manor. The children of villeins were born into the same bondage as their parents.

Lands held in villeinage often were handed down from father to son until the family acquired a right to them by *prescription* (long use). But the villein still had to serve his master. The villein's sole title to his land was a copy of the entries on the court roll. For this reason, villeins came to be called *tenants by copy of court roll.* Tenure of this type was called *copyhold.* This tenure existed until it was practically abolished by the Copyhold Act of 1894. The Property Act of 1925 ended all tenure by copyhold.

Villeinage began to decline in the 1100's when the villein began to exchange his labor services for money payments. In the end, the villein became a free tenant who paid a rent for his land. By the early 1500's, few villeins were left in England. The contempt in which the villeins were commonly held may be responsible for the fact that we get the word *villain* from the earlier word *villein.* BRYCE LYON

See also FEUDALISM; SERF.

VILLI, plural of villus. See INTESTINE.

VILLON, *vee YOH,* **FRANÇOIS** (1431- ?), was a great French poet. His principal works are *Le Petit Testament* and *Le Grand Testament.* His fast-moving verses bring to life an astonishingly vivid and colorful description of the sights, sounds, and smells of Paris.

Villon ridiculed the great and the powerful. He poked fun at lawyers, churchmen, and merchants, and laughed at the tricks, shady dealings, and bawdy jokes of sharpsters, thieves, prostitutes, and rowdy students. But Villon also wrote poetry of great tenderness, charm, and melancholy. He was sincerely religious and his deepest

themes include brotherhood and love for humanity.

Villon was born in Paris and studied for the clergy at the University of Paris. But he became involved in murder, theft, and street brawls. He was sentenced to be hanged in 1463, but his sentence was reduced to banishment from Paris. Nothing is known of his life after this date. JOEL A. HUNT

VILNIUS (pop. 386,000) is the capital of Lithuania, now a state of Russia. It is called VILNYUSE in the Russian language and WILNO in Polish. Vilnius lies in southeastern Lithuania (see RUSSIA [political map]). It was the old capital of Lithuania, and became the capital again when the country declared its independence from Russia after World War I. It was the capital of independent Lithuania from 1918 to 1940. However, from 1920 to 1939, while Vilnius was occupied by Poland, a provisional capital was set up at Kaunas.

Russia restored the city to Lithuania when it seized eastern Poland in 1939. But Soviet troops again seized Vilnius in 1940. Germany captured Vilnius in 1941, but lost it three years later. The Communists made Vilnius a railroad and manufacturing city. From 1600 onward, it had been a center for Lithuanian, Jewish, and Polish culture. But the Communists have tried to introduce Russian culture to the city. FRANCIS J. BOWMAN

VIMINAL HILL. See ROME (The City Today).

VIMY RIDGE, BATTLE OF, *VEE mee*, was a World War I battle in which Canadian forces scored an important victory over the Germans. In the battle, the Canadians captured Vimy Ridge, a strategically located hill near the town of Arras, in northern France.

The battle began April 9, 1917. The Canadian Corps was part of the British Army, and the battle was part of the British spring offensive. The British attacked Arras while the Canadians attacked the ridge. The chief goal of this offensive was to draw German troops away from Aisne, a town to the south that the French were to attack a week later. The other goal was to win Vimy Ridge and Arras. The Canadians took the ridge on April 14. Of the 100,000 Canadians who took part in the battle, 3,598 were killed and 7,004 wounded. The British offensive succeeded. But the French offensive, and the Allied offensive as a whole, failed. P. B. WAITE

VIÑA DEL MAR, *VEE nyah del MAHR* (pop. 145,-658), is the leading seaside resort city of Chile. It lies on the Pacific coast, about 4 miles (6 kilometers) north of Valparaíso. Viña del Mar's mild climate, beaches, hotels, nightclubs, and race tracks make it one of the most popular vacation spots in South America. The city has several food processing plants. Oil refineries are located nearby. Viña del Mar, Valparaíso, and Concón to the north form Chile's second largest metropolitan area. See also CHILE (political map; color picture: Well-to-Do Chileans). KALMAN H. SILVERT

VINCENNES, Ind. (pop. 19,867), a manufacturing and trading center in southwestern Indiana, is the oldest city in the state. It lies on the Wabash River, which forms the Indiana-Illinois boundary in the region. The city is about 100 miles (160 kilometers) southwest of Indianapolis (see INDIANA [political map]). Hundreds of persons visit Vincennes every year to see its historical buildings and memorials. These include the building in which the legislature of the Indiana Territory held its first sessions; the mansion called *Grouseland*, built by William Henry Harrison while he was territorial governor; and the George Rogers Clark Memorial, which stands on the site of old Fort Sackville. The Lincoln Memorial Bridge spans the Wabash River where the Thomas Lincoln family crossed when they went from Indiana to Illinois in 1830.

Industry and Trade. Vincennes is well situated for a manufacturing and trading center. Freight railroads, major highways, and the Wabash River provide good transportation. The city lies in a region which contains coal, and oil and natural-gas fields. The chief industries of Vincennes produce batteries, containers, electronic instruments, fiberboard, fiberglass products, shoes, structural steel products, and window glass. Vincennes University has its campus in the city.

History. Historians disagree as to the date of the first settlement on the site of Vincennes. Some say settlers came shortly after 1700, which would make Vincennes one of the oldest settlements outside the original 13 colonies. Most historians agree that by about 1731, the French had founded the first permanent settlement in Indiana there. The French community that grew up near the settlement devoted itself mainly to farming.

Around 1733, a fort was built at the village and placed under the command of the Sieur de Vincennes. His name was given to the town soon after Indians captured and put him to death about 1736. The fort became Fort Sackville after France gave up the eastern part of the Mississippi Valley to the British in 1763.

During the Revolutionary War, George Rogers Clark occupied the fort. The British seized Fort Sackville in December, 1778, but, later that winter, Clark recaptured it for the Americans. This victory helped win the old Northwest for the new United States.

Vincennes was the capital of Indiana Territory from 1800 to 1813. The town became the county seat of Knox County early in the territorial period. It was incorporated as a city in 1856. Vincennes has a mayor-council form of government. PAUL E. MILLION, JR.

VINCENT DE PAUL, SAINT. See SISTERS OF CHARITY.

VINCENT OF BEAUVAIS. See ENCYCLOPEDIA (The First Reference Works).

VINCENT'S ANGINA. See TRENCH MOUTH.

VINCI, LEONARDO DA. See DA VINCI, LEONARDO.

VINE usually means a plant that has a weak and flexible stem requiring some kind of support. Some vines can climb walls, trellises, or other plants. Other vines creep along the ground. Some vines have tendrils which wind around their support. Other vines have disks which cling to the object which they are climbing. There are two important kinds of vines—*woody* vines and *herbaceous* vines. Grapes are woody vines. Sometimes the woody vine is fairly short, and can support itself. Then it is somewhat like a shrub. It is often difficult to tell the difference between such a vine and a shrub. Common kinds of herbaceous vines include cucumbers, garden peas, and beans. WILLIAM C. BEAVER

Related Articles in WORLD BOOK include:

Bean	Cranberry	Morning-Glory
Betel	Gourd	Pea
Bignonia	Grape	Pelican Flower
Bittersweet	Greenbrier	Philodendron
Bramble	Honeysuckle	Smilax
Clematis	Hop	Virginia Creeper
Cowpea	Ivy	Wisteria

VINEGAR is a sour liquid for seasoning foods. It also is used in pickling and processing fruits, vegetables, and meats. The name *vinegar* is from the French word *vinaigre*, which means *sour wine*. But many kinds of vinegar are not made from wine.

Vinegar is a result of the chemical change known as *fermentation*. A *dilute* (weak) alcohol is the raw material from which all vinegar is made. The alcohol may be produced from the fermentation of the juice of any fruits, berries, or even melons. Malt vinegar is made from cereals. Vinegar is also made from sugar solutions, such as molasses, sugar syrup, or honey.

Making Vinegar. Cider vinegar is made from the juice of apples, or *cider*. Fermentation changes the fruit sugar in the juice into alcohol and carbonic gas. The gas evaporates, or passes off, leaving the alcohol and fruit flavors, or *esters*. *Oxidation* changes cider into vinegar. The oxygen in the air comes in contact with the alcohol in the cider, and with the aid of the vinegar bacteria (*mycoderma aceti*) the alcohol changes into vinegar.

The two general methods of making vinegar are the slow, natural process and the quick process. The *slow* process may take from one to two years, depending on temperature and access to air. The fermented liquid may be kept in a special oak barrel, or cask, with holes to permit air circulation. It should be only about four-fifths full, so as to allow ample air space. The alcohol in the cider, being lighter than the other part of the liquid, tends to rise to the top. As the alcohol comes in contact with air, acetic acid is formed. As the top layer changes into acetic acid, it increases in weight and gradually sinks to the bottom of the barrel. This continues until almost all the alcohol becomes vinegar.

In the *quick* method, the fermented cider is circulated continuously through vats called *generators*. The generators are filled with such porous material as corncobs, rattan shavings, or coke. Lukewarm, strong cider vinegar is circulated through the porous material for 24 to 48 hours. Then the fermented cider is fed into the top of the generator through a revolving spray, or *sparger*. The cider is split into drops, and each drop is brought into contact with currents of air that enter through holes near the bottom of the generator. An efficiently run generator converts 1,000 to 2,000 gallons (3,800 to 7,600 liters) of cider into vinegar in 48 to 72 hours.

During the process of converting fermented fruit juices into vinegar, particularly cider vinegar, a slimy scum called *mother of vinegar* (*bacterium xylinum*) forms. Manufacturers try to prevent the formation of vinegar mother. It slows down the circulation of air.

Kinds of Vinegar. The flavors, colors, and odors of various kinds of vinegar come from the substances from which they are made. Cider vinegar has an applelike odor, and is brown or yellow. Distilled vinegar is water-white in color and has no flavor, other than acidity. Most of this vinegar is made from molasses. But some is made from *whey* (liquid part of milk) which contains sugar. Four per cent is the legal minimum acid strength for commercial vinegar. WALTER H. HILDICK

See also ACETIC ACID; CIDER; FERMENTATION.

VINEGAR BIBLE. See BIBLE (Some Famous Bibles).

VINEGAR EEL is a tiny roundworm that lives in vinegar. Vinegar eels are usually found in barrels or jars of cider vinegar. They feed on fruit pulp and the bacteria which produce the vinegar from the cider. Vinegar eels are harmless when swallowed by man.

The vinegar eel is slender and threadlike and about $\frac{1}{16}$ inch (1.6 millimeters) long. There are separate males and females. Most females live about ten months and produce as many as 45 tiny larvae which are about $\frac{1}{100}$ inch (0.25 millimeter) long.

Scientific Classification. The vinegar eel is genus *Turbatrix* (*Anguillula*), species *T. aceti*, and belongs to the roundworm class *Nematoda* of the phylum *Aschelminthes*. JAMES A. MCLEOD

See also ROUNDWORM.

VINEGAR JOE. See STILWELL, JOSEPH WARREN.

VINER, CHARLES. See BLACKSTONE, SIR WILLIAM.

VINEYARD. See GRAPE.

VINLAND is the name early Scandinavian explorers gave to a region on the east coast of North America. Many historians believe that Norwegian vikings visited this coastal area almost 500 years before Christopher Columbus sailed to America in 1492. Some historians believe Vinland was probably in the region of Cape Cod, Mass. Others believe it was in Newfoundland. In the early 1960's, archaeologists found the remains of a viking settlement near Flower's Cove, Newfoundland.

Early Norse *sagas* (stories of heroic deeds) tell of the explorers' voyages. Many historians do not consider these stories as completely reliable. These tales describe a fertile land with a mild climate. The Norsemen called the region *Vinland* (also spelled *Vineland* or *Wineland*) because of the grapes that grew there. The sagas tell that Leif Ericson, son of Eric the Red, visited Vinland about A.D. 1000. Historians believe the Norsemen had to abandon Vinland because they could not defend their settlements against hostile Indians. WILLIAM BARK

VINSON, *VIN s'n*, **FREDERICK MOORE** (1890-1953), became Chief Justice of the United States in 1946. He served as a Democratic member of the United States House of Representatives from Kentucky from 1923 to 1929, and again from 1931 to 1938. He then served until 1943 as associate justice of the United States Court of Appeals for the District of Columbia.

Vinson became director of the Office of Economic Stabilization in 1943, and then director of the Office of War Mobilization and Reconversion. President Harry S. Truman named him Secretary of the Treasury in 1945. Vinson served about a year, and had an important part in arranging financial settlements at the close of World War II. He was born in Louisa, Ky., and studied at Centre College. MERLO J. PUSEY

VINYL, *VY nuhl*, is one of the most useful plastics materials ever developed. Vinyl plastics, often called simply *vinyls*, are durable and inexpensive. They can be used in making a wide variety of products, including phonograph records and leatherlike upholstery. Manufacturers make vinyl plastics from such natural substances as natural gas, petroleum, and salt.

Characteristics. Vinyls may have the stiffness of wood or the flexibility of cloth. They may be any color, and they may be transparent. Vinyls do not break or tear easily, and they rarely are harmed by acids, alcohol, oils, or water. Products made of *rigid* (stiff) vinyl may begin to lose their shape at a temperature of about 150° F. (66° C). Most vinyls burn slowly.

Rigid vinyl products include containers, toys, and

water pipes. Flexible vinyl items include electrical insulators, floor tiles, garden hoses, shower curtains, and leather-like clothing and luggage. Vinyl coatings keep cardboard milk cartons from becoming soggy and enable wallpaper to resist stains.

All vinyl plastics contain a chemical substance called *vinyl*, which has the formula CH_2CH-. Manufacturers combine vinyl with various other substances to produce several kinds of vinyl plastics. For example, combining vinyl with chlorine produces a gas called *vinyl chloride*. Through the process of *polymerization*, this gas is then used to produce a solid plastic, *polyvinyl chloride* (PVC). See PLASTICS (How Plastics Are Made; illustration).

History. In 1927, PVC became the first vinyl plastics material to be manufactured commercially. Through the years, chemists improved vinyl plastics, and manufacturers found many new uses for these materials. In 1973, United States production of vinyl plastics totaled 4.6 billion pounds (2.1 billion kilograms). During the mid-1970's, medical research indicated that serious illnesses, including a form of liver cancer, may result from breathing air polluted with vinyl chloride, the gas used in manufacturing PVC. As a result, plastics manufacturers sped up the development of safety programs that would greatly reduce the amount of vinyl chloride in the air breathed by workers. RICHARD F. BLEWITT

VINYL CHLORIDE. See VINYL.

VINYON. See FIBER (Synthetic Fibers).

VIOL is the name of a class of stringed instruments played with a bow. Instruments of the violin type developed from the viols. Viols were the chief bowed string instruments in use from about 1500 to 1700.

Viols had a flat back, sloping shoulders, a broad, thin neck, and angular corners. These instruments were usually larger and more awkward than today's violins. Early viols had from five to seven strings. Some of the fingerboards had frets, while others did not. Today's violin comes from the treble viol, the viola from the tenor viol, and the cello from the larger viola da gamba, or *knee fiddle*. The double bass has many features of the *basso da camera*, or contrabass viol. CHARLES B. RIGHTER

See also BASS; CELLO; VIOLA; VIOLIN.

VIOLA, *vee O luh*, is a stringed instrument played with a bow. It is similar to a violin in shape and the way it is played. It is larger than the violin and ranges from 24 to 27 inches (61 to 69 centimeters) in length. The viola is the tenor voice in the string quartet and in the string section of the orchestra. It may be used as a solo instrument. CHARLES B. RIGHTER

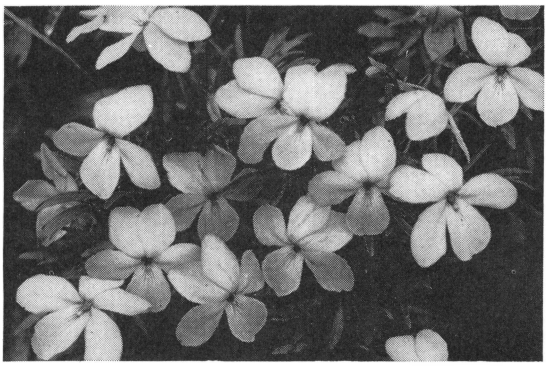
See also VIOLIN.

VIOLA DA GAMBA. See VIOL.

VIOLENCE. See RIOT; REVOLUTION; CRIME.

VIOLET is the common name of a group of flowering plants. Their blossoms are among the most attractive of all flowers. Violets grow throughout most of the world. They bloom in groups in early spring. Heart-shaped leaves partly conceal the five-petaled flowers. Each flower grows on a slender stalk. There are more than 300 species of violets. About 100 of these grow in the United States. Some varieties bear white and yellow flowers, but the blue and purple violets are world favorites.

Purple violets include the common *meadow*, or *hooded*, *violet*, and the *bird's-foot violet*, whose blue and purple flowers often bloom twice a year, in spring and summer.



Visual Education Service

The Bird's-Foot Violet Often Blooms Twice a Year.

The bird's-foot violet received its name because its leaves are shaped like birds' feet.

The *dog violet* is so called by the English because it lacks fragrance. The word *dog* is a term of contempt. It is quite different from *dogtooth violet*, a member of the lily family. The pansy is a cultivated kind of violet.

The violet was adopted as state flower by Illinois, New Jersey, Rhode Island, and Wisconsin. The violet is also the flower for the month of March.

Scientific Classification. Violets belong to the violet family, *Violaceae*. They are in the genus *Viola*. The blue violet is classified as *V. papilionacea;* the bird's-foot, *V. pedata;* the dog, *V. canina*. The wild form of the cultivated pansy is *V. tricolor*. THEODOR JUST

See also FLOWER (color picture: Flowers of the Woodland); PANSY.

WORLD BOOK photo, courtesy Chicago Symphony Orchestra

The Viola looks like a large violin, and the musician holds and plays it like a violin. But the viola has a full, rich tone and a pitch lower than that of a violin.

VIOLIN is a stringed instrument that is played with a bow. It is probably the best known and most widely used of all orchestral instruments. Some of the greatest music in the world owes much of its beauty to the violin. Such music may be the sound of a mighty orchestra, with dozens of violins playing together. Or it may be the music produced by one great master playing alone on a violin to a hushed audience.

Several other instruments are similar to the violin in construction and in method of playing. These include the cello and viola. They are considered members of the *violin family.*

Music for the violin covers a wide range. Some composers, such as Johann Sebastian Bach, have written music for the violin alone. Many composers have written pieces for the violin with piano or orchestral accompaniment. The violin also has an important role as part of a group of instruments, as in an orchestra or in a string quartet.

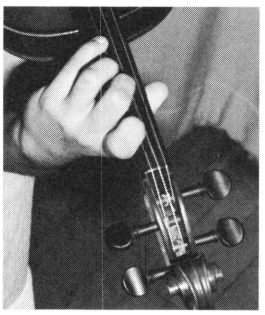
Parts of the Violin. A violin is a special kind of box that *amplifies* (makes louder) the sound of the strings stretched across it. If you stretch a piece of string tightly and then pluck it, you will hear a faint note. If you stretch it across a wooden box, you will hear a much louder note. A violin-maker uses soft pine or spruce for the *belly* (front) of the violin, and maple or sycamore for the *back* and the *ribs* (sides). He makes the *head* (scroll and peg-box) and *neck* of maple. He carves the graceful shapes of the back and belly out of solid pieces of wood. The violin-maker cuts two *f-holes* in the belly to allow the sound to escape. He makes the *fingerboard* and the *tailpiece* (string-holder) of ebony, an extremely hard wood that will be long lasting. The violin-maker glues the violin parts together, using no nails or screws.

The violin has four *strings*, which are tuned in fifths. The first (*E*) string is generally made of steel. The second (*A*) string and the third (*D*) string are often made of plain *catgut*, a material made from the intestines of sheep. But most players prefer to use *A* or *D* strings made of a thinner gut over-wound with fine aluminum wire. Synthetic materials such as nylon are also used. The fourth (*G*) string is generally made of gut covered with silver or copper wire. The strings are attached to pegs set in the head of the violin. The player tightens the strings with these pegs to tune them to the correct notes.

There are two other important parts of the violin that are not permanently glued to the body. The *bridge* stands on the belly, midway between the two *f*-holes. It supports the strings. A pattern of holes is cut into the bridge to give it greater flexibility. The *sound-post*, a thin rod of pine, is wedged between the back and the belly underneath the bridge, inside the violin. The sound-post conducts the sound from the front to the back of the violin. It also supports the belly against the pressure of the strings. The sound-post is slightly behind one foot of the bridge. The *bass-bar*, a bar

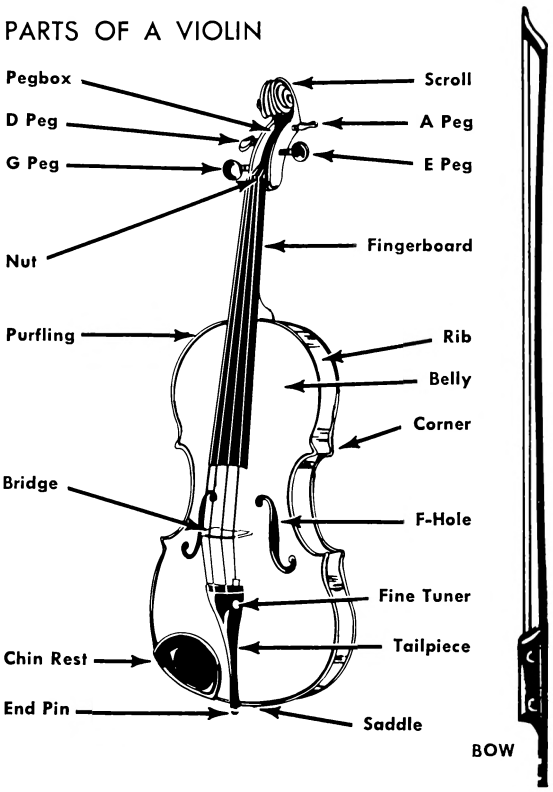
Reinhard G. Pauly, the contributor of this article, is a violinist and Chairman of the Department of Music at Lewis and Clark College in Portland, Ore. He is the author of Music in the Classic Period.

DePaul University



Playing the Violin properly requires correct body and hand positions. Tuck the instrument under your chin and rest it on your shoulder. Keep your chin in a straight line with the scroll, *above*. Keep your left elbow in close to the body. Cup your fingers over the strings, and rest the thumb under the fingerboard, *right*.

PARTS OF A VIOLIN



of pine that is glued on the underside of the belly, gives further support for the belly. It runs lengthwise underneath the other foot of the bridge.

The Bow is a curved, springy stick about 27 inches (69 centimeters) long that has a flat ribbon of hair attached to it. This ribbon consists of more than 150 horsehairs. The hair is attached to the point of the bow and to a sliding wood block called a *frog* or *nut* at the other end, near the point at which the violinist holds the bow. By turning a screw set into the end of the bow, the player can move the frog back and forth to tighten the hair against the spring of the bow. The bow is made of *Pernambuco wood*, a light, springy wood from a tree that grows in Brazil.

Playing the Violin. The player tucks the end of the violin between his chin and his left shoulder. To obtain a good grip, he uses a *chin-rest* clamped to the top of the violin, and a *shoulder-rest* or a *pad* between the back of the violin and his shoulder. He should be able to support the violin entirely without the aid of his left hand. He holds the bow in his right hand.

The player makes the strings of the violin vibrate by drawing the hair of the bow across them. Each of the separate strands of hair on the bow is rough, with minute projections. These projections make the strings vibrate as the bow slides over them. The player can vary the loudness of the tone and get other special effects by the way in which he draws the bow across the strings. He can also pluck the strings with his fingers, a form of playing known as *pizzicato*.

The strings of the violin give the player four notes. To obtain other notes, the player shortens the vibrating length of the strings by pressing them down on the fingerboard with the fingers of his left hand. Flute-like tones called *harmonics* can be produced by touching the strings lightly in certain places.

History. Musicians have used many kinds of stringed instruments, such as harps and lyres, for thousands of years. But no one knows when players began to use bows, instead of just plucking the strings. Chinese players used bowed instruments in the A.D. 900's. A hundred years later, musicians used forms of bowed instruments in many countries of Asia, Europe, and northern Africa. In the 1400's, players started using bows to play instruments of the guitar family. These bowed guitars developed into the instruments called viols.

The first violins date from the 1500's. They were developed from the early bowed instruments, rather than from the viols. For many years, viols and violins developed side by side, each influencing the other. But by the late 1600's, most musicians favored the violin family, and the viols dropped out of use.

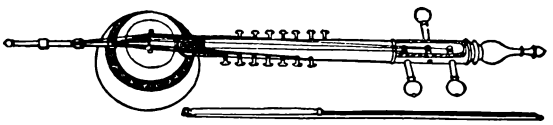
The little Italian town of Cremona became an important center of violin making. Members of the Amati family made fine instruments there in the late 1500's and early 1600's. In the 1600's, Antonio Stradivari, a pupil of the Amatis, perfected the design of the violin and produced some of the finest instruments ever made. Another great family was that of Guarneri. The instruments of Giuseppe Guarneri, who was known as Guarneri del Gesù, rival those of Stradivari for tone. Many great violin-makers worked in Germany. At one time, people considered the violins of the German Jacob Stainer to be finer than those of Stradivari. A Frenchman, François Tourte, perfected the bow in the late 1700's.

In the 1600's, 1700's, and early 1800's, many of the outstanding violinists were also the main composers for violin. Their works led to developments in playing technique. Among the most important were Arcangelo Corelli, Antonio Vivaldi, Giuseppe Tartini, Giovanni Viotti, Pierre Rode, Rodolphe Kreutzer, and Niccolò

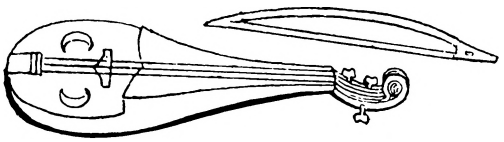
HISTORIC VIOLINS

The first reference to stringed instruments appears in Persian and Chinese writings from the 800's. Developments over the next 800 years led to the superb violins of Stradivari.

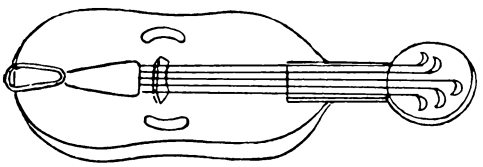
From *Harvard Dictionary of Music* by Willi Apel, © 1950, Harvard University Press; Lyon & Healy



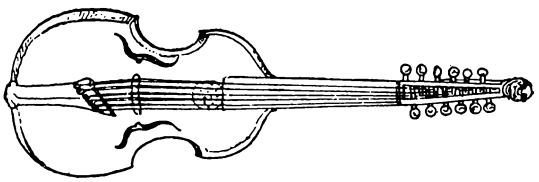
The Kemantche, an ancient Persian stringed instrument, consisted of a long stick extending through half of a coconut.



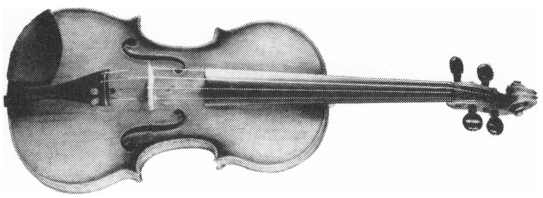
The European Rebec, popular in medieval times, resembled a long slender pear. It probably originated in the Orient.



The Vielle ranked as the most important stringed instrument in the 1100's and 1200's. This European fiddle had five strings.



The Viola d'Amore was held and played like the violin of today. It was used in Europe in the 1500's and 1600's.



Violins Made by Antonio Stradivari in the late 1600's and early 1700's have never been surpassed in tone, power, and form.

Paganini. Viotti has been called the father of modern violin playing. He greatly improved and extended the use of the bow. In the 1800's and 1900's, many composers wrote important music for the violin.

Great violin players of the 1900's include Jascha Heifetz, Fritz Kreisler, Yehudi Menuhin, Nathan Milstein, David Oistrakh, and Isaac Stern. REINHARD G. PAULY

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VIOLONCELLO. See CELLO.

VIPER is any one of a group of poisonous snakes. Vipers have a pair of long, hollow fangs in the upper jaw. Many of them have a deep hollow in the side of the head, a little lower than the eye and in front of it. Snakes with this hollow, or pit, are *pit vipers*. Those without it are *true vipers*.

True vipers live in Africa, Europe, Asia, and the East Indies. Pit vipers live in the Americas, the East Indies, Asia, and Europe east of the lower Volga River. Of every 100 snakes, about eight are vipers. Over half of the vipers have the pit.

A viper's poison is formed in special glands. The hollow fangs then carry it into the victim's body the way a hypodermic needle injects serum. All vipers can be dangerous to man, but many of the small kinds rarely, if ever, kill anyone with their bite. Certain kinds of large vipers are so harmless that they will not bite unless someone teases or annoys them.

Vipers have a head much broader than the neck, and eyes with catlike pupils, but so do many other snakes. Vipers, therefore, cannot be recognized with any degree of certainty by the shape of the head and pupils. Most vipers have thick bodies and rather short tails.

The facial pit of the pit viper is connected with the brain by a well-developed nerve. The nerve, a sense organ, is highly sensitive to heat. It helps the pit viper to locate and secure its warm-blooded prey.

The most familiar American vipers are the *rattlesnakes*, *water moccasin*, *copperhead*, *bushmaster*, and *fer-de-lance*. The last two live in many parts of tropical America, but not in the United States. Only the bushmaster lays eggs. The others bear their young alive.

The *common viper*, or *adder*, is the only poisonous reptile of Great Britain. Other familiar true vipers include the *Gaboon viper* and *puff adder* of Africa, and *Russell's viper* of Asia and the East Indies. Most true vipers bear their young alive.

Scientific Classification. Vipers make up the viper family, Viperidae. True vipers belong to the subfamily Viperinae. The common European viper, or adder, is genus *Vipera*, species *V. berus*. Other true vipers include the Gaboon viper, *Bitis gabonica;* the puff adder, *B. arietans;* and Russell's viper, *Vipera russelli*. Pit vipers belong to the subfamily Crotalinae. They include the rattlesnakes, which are genera *Crotalus* and *Sistrurus;* the bushmaster, *Lachesis muta;* the copperhead, *Agkistrodon contortrix;* the water moccasin, *A. piscivorus;* and the fer-de-lance, *Bothrops atrox*. CLIFFORD H. POPE

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Copperhead
Fer-de-Lance
Rattlesnake
Snake
Water Moccasin

VIPER'S BUGLOSS, *BYOO glahs*, is a plant that is also known as blue thistle. It has a spotted stem and showy blue flowers. It is a biennial, and seeds planted one year will not produce flowers until the next year. The flowers are reddish when they are budding, but turn blue when they open fully. The viper's bugloss grows widely in the dry pastures of the eastern United States. People once thought viper's bugloss cured viper bites.

Scientific Classification. Viper's bugloss belongs to the borage family, Boraginaceae. It is classified as genus *Echium*, species *E. vulgare*. WALTER C. MUENSCHER

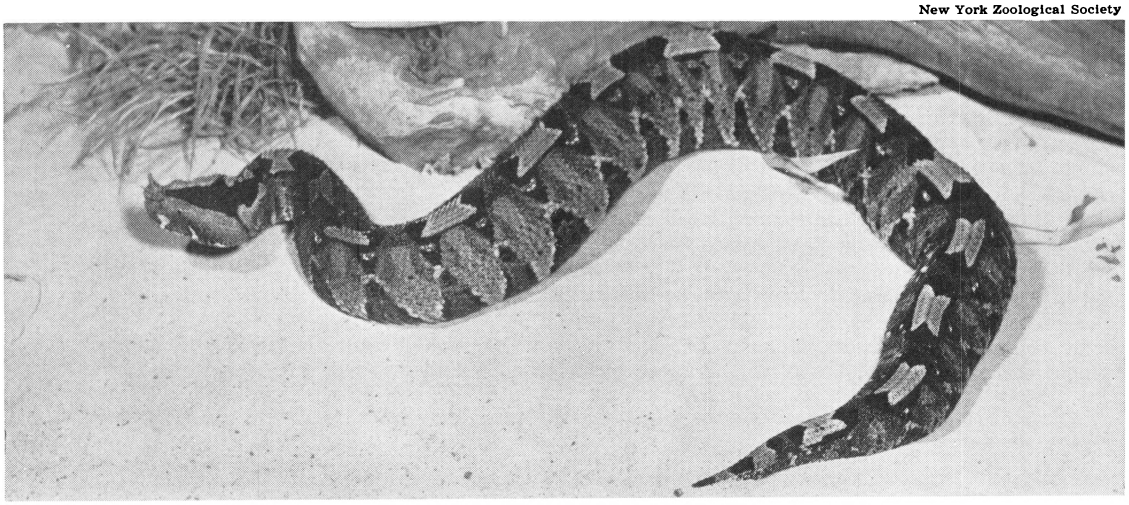
VIRACOCHA. See INCA (Religion).

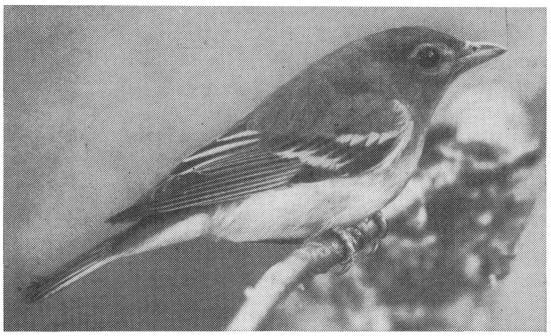
VIRCHOW, *FIHR koh*, **RUDOLF** (1821-1902), a German scientist and political leader, is considered the father of *pathology* (the study of diseased body tissue). He did important research in leukemia, tuberculosis, rickets, tumors, and trichinosis. His hygienic reforms in Berlin were important advances in public health.

Virchow entered politics in 1862, and was elected to

The Rhinoceros Viper Lives in Swamp Areas in the Rain Forests of Central Africa.

New York Zoological Society





Arthur A. Allen

The Yellow-Throated Vireo builds its nest high in the treetops. It has a weak but musical song.

the Prussian Assembly. After Germany was united, he served in the Reichstag (parliament) until 1893. He became a leader of the Liberal party and a bitter opponent of Chancellor Otto von Bismarck. Virchow was born in Pomerania. ROBERT G. L. WAITE

VIREO, *VIR ee oh,* is the name of a family of small birds. They stay close to the foliage in the forests, and feed on insects. People also call the birds *greenlets* because of their greenish color. Vireos live only in North America, chiefly in the tropics. A few species migrate as far north as the United States and Canada.

The best-known vireo is the red-eyed vireo. People can recognize this bird by its red eyes, which have a white line with a black border above them. The note it sings sounds rather conversational, as if the bird were talking to any listener. Since it repeats this note continually, the vireo is often called the *preacher bird.*

Vireos build cup-shaped nests which hang from forked branches in the trees. The female lays three or four white eggs marked with a few dark specks near the large end. Vireos help man by eating harmful insects.

Scientific Classification. Vireos make up the family *Vireonidae.* The red-eyed vireo is genus *Vireo,* species *V. olivaceus.* LEONARD W. WING

See also BIRD (color picture, Favorite Songbirds).

VIRGIL, or VERGIL (70-19 B.C.), was the greatest poet of ancient Rome and one of the outstanding poets of the world. His masterpiece was the *Aeneid,* the national epic of Rome.

His Life. Virgil was born in Andes, a tiny village near Mantua in northern Italy. His full name in Latin, the language of ancient Rome, was Publius Vergilius Maro. Virgil attended schools in Cremona, Milan, Naples, and Rome. He intended to pursue a law career, but his shyness and awkward manner stood in the way. He turned to poetry instead. His poems attracted the attention of Maecenas, a wealthy patron of the arts and a political adviser to the future emperor, Augustus. Virgil became one of a group of writers who gathered around Maecenas.

Maecenas gave Virgil a house near Naples and encouraged him to write patriotic poems, including the *Aeneid.* Virgil died before he finished the *Aeneid,* and left instructions that the poem be destroyed because he was dissatisfied with it. However, Augustus disregarded Virgil's wish and appointed two of the poet's friends to prepare the *Aeneid* for publication.

His Works. Some scholars attribute a number of minor poems, collected under the title *Virgilian Appendix,* to Virgil's early years. Virgil wrote his first important poems, the *Eclogues,* or *Bucolics,* between 42 and 37 B.C. These 10 poems are *pastorals*—that is, they deal with the lives of shepherds. In writing the *Eclogues,* Virgil imitated the pastoral poems of the Greek poet Theocritus. But Virgil adapted the Greek settings and themes to the Italian scene. In melodious verse, the *Eclogues* describe the tranquil beauty of country life. The fourth *Eclogue* foretells the birth of a miraculous child who will bring in a new age. Emperor Constantine, Rome's ruler in the early A.D. 300's, and some Christian writers interpreted this prophecy as referring to Jesus Christ.

Virgil spent about seven years writing the *Georgics,* four poems published in 29 B.C. On one level, the *Georgics* are instructive poems about farming. The first poem deals with crops, the second with vines and olives, the third with cattle and horses, and the fourth with bees. But the *Georgics* go beyond practical instruction to celebrate the joy and harmony of farm life. The deep thoughts expressed in the *Georgics* show that Virgil was a philosopher as well as a poet.

For the story of the *Aeneid,* Virgil drew on many sources, the most important being the works of the Greek poet Homer. Virgil based the first six books of the *Aeneid* on Homer's *Odyssey* and the last six on Homer's *Iliad.* Despite Virgil's debt to others, the *Aeneid* is a stately, powerful, and original work.

The *Aeneid* describes the adventures of Aeneas, the legendary Trojan hero who survived the fall of Troy, sailed westward to Italy, and founded the city of Rome. But the *Aeneid* is not just the story of Aeneas. The poem also shows that Rome became great as part of a divine plan. Virgil incorporated in his poem all of Rome's history up to his own time. He represented Augustus as Aeneas' direct descendant and as a leader appointed by the gods. In this way, Virgil glorified Augustus and expressed the emperor's ideals and his hopes for the Roman Empire. Virgil's message was that Rome, led by Augustus and protected by the gods, had a mission—to bring peace and justice to the world.

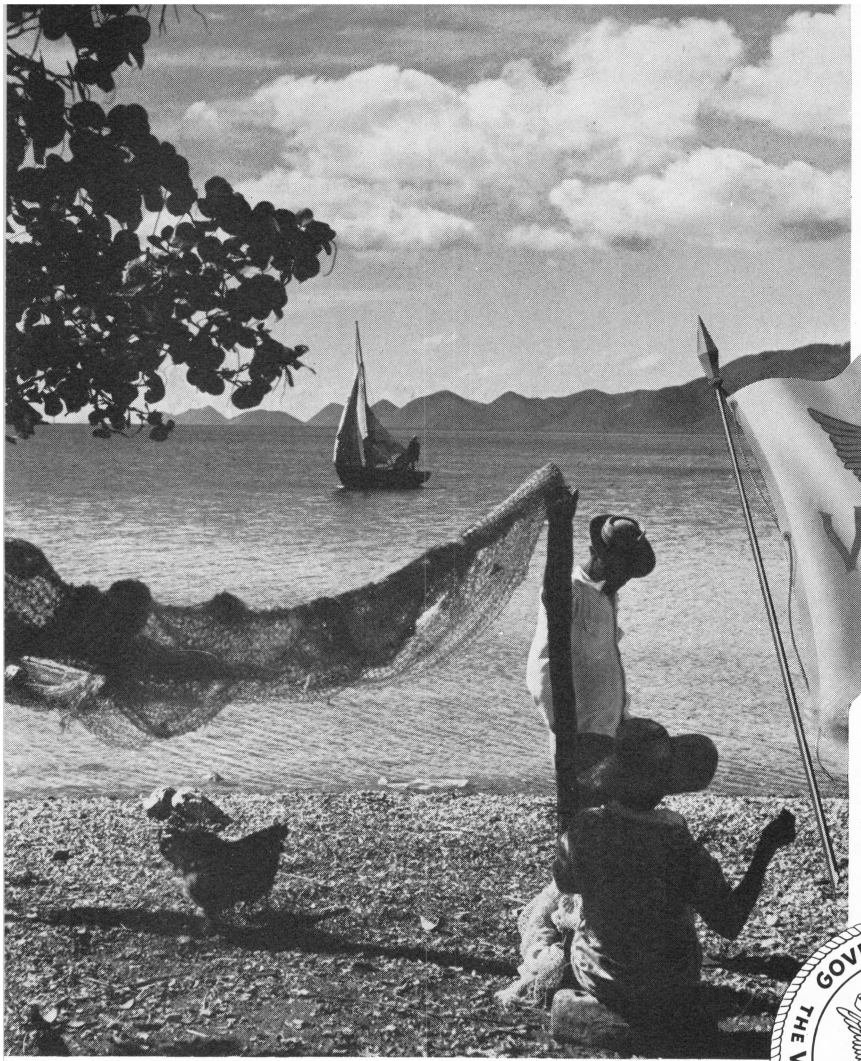
His Influence. Roman schools used Virgil's works as textbooks by A.D. 100. Copies of the *Aeneid* were kept in Roman temples, and people practiced prophecy by opening the poem at random and interpreting the first words they saw. Later, Christian writers used verses from Virgil's poems to express their own beliefs. During the Middle Ages, people regarded Virgil as a prophet who had foreseen the coming of Christ. They even considered him to have been a magician.

The Italian poet Dante Alighieri based his great epic, the *Divine Comedy* (1321), on the sixth book of the *Aeneid.* Dante regarded Virgil as his literary master, and in the *Divine Comedy* he has Virgil guide him on his journey through hell and purgatory.

During the Renaissance, Virgil's *Eclogues* influenced the pastoral poetry of such writers as Petrarch of Italy, Joachim du Bellay of France, and Sir Philip Sidney of England. From the 1500's through the 1700's, English writers regarded Virgil as the ideal poet. For example, the poet John Milton often imitated Virgil in his own works, especially *Paradise Lost* (1667). The poet John Dryden translated the *Aeneid* into English verse in the late 1600's. Virgil also influenced many writers during the 1800's, including the English poets William Wordsworth and Lord Tennyson. HERBERT MUSURILLO

See also AENEID.

VIRGIN ISLANDS



Fritz Henle

Virgin Islands Fishermen catch bonito, red snapper, kingfish, and Spanish mackerel to add variety to their menu. Nets are hung on poles on the beach when not being used or mended.

The Territorial Flag

The Territorial Seal

VIRGIN ISLANDS is the name of two groups of small islands east of Puerto Rico. They lie between the Caribbean Sea and the Atlantic Ocean. One of the groups consists of St. Croix, St. John, and St. Thomas islands, together with many nearby islets. This group is called THE VIRGIN ISLANDS OF THE UNITED STATES. It is the easternmost United States possession. The other group includes Anegada, Jost van Dyke, Tortola, and Virgin Gorda islands, with their own surrounding islets. It is called the BRITISH VIRGIN ISLANDS.

Christopher Columbus discovered the Virgin Islands on his second voyage to the Americas in 1493. The fresh beauty and untouched appearance of their hills rising from the sea charmed him. He named the group the Virgin Islands, in memory of St. Ursula and her 11,000 maidens (see URSULA, SAINT).

Columbus claimed all the islands for Spain, but the Spaniards did not settle there. The British Virgin Islands have been under the British flag since 1672. About that same time, Denmark established a permanent settlement on St. Thomas. The Danes took possession of St. John in 1717, and bought St. Croix from France in 1733. In 1917, Denmark sold its West Indian possessions to the United States for $25 million, or about $295 an acre.

All the Virgin Islands except Anegada and St. Croix are rugged and hilly. A few good harbors in the group make it an important trade center. Watch movements, petroleum products, and refined bauxite are among the major exports of the American islands. The soil is fertile, but the land has not been intensively cultivated. The Virgin Islands produce limited amounts of beef cattle and some fruits and vegetables.

The Virgin Islands of the United States proved to have great military importance during World War II, especially as an outpost to protect the Panama Canal. Today, the island group is a popular tourist and resort area. Congress created the Virgin Islands Na-

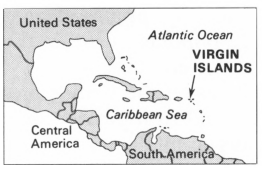
tional Park on Aug. 2, 1956, adding greater interest in the group as a tourist center.

The rest of this article deals with the Virgin Islands of the United States. For information on the British-owned islands, see VIRGIN ISLANDS, BRITISH.

The Land and Its Resources

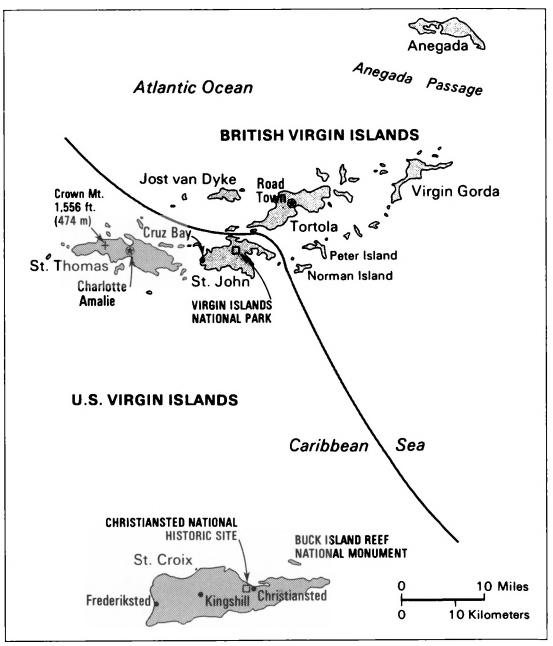
Location and Size. The Virgin Islands of the United States lie about 40 miles (64 kilometers) east of Puerto Rico, just west of the British Virgin Islands. The group forms the westernmost part of a great chain of West Indian islands called the Lesser Antilles (see ANTILLES; WEST INDIES). Miami, Fla., lies about 1,100 miles (1,770 kilometers) to the northwest, and Panama is about 1,200 miles (1,930 kilometers) to the southwest. The Virgin Islands cover 133 square miles (344 square kilometers). Rhode Island, the smallest state in the Union, is over nine times as large. The islands have a general coastline of 117 miles (188 kilometers), and a *tidal shoreline*, including offshore islands, sounds, bays, rivers, and creeks, of 175 miles (282 kilometers).

Islands. All the American islands, except St. Croix, are rugged and hilly. Only three of the islands are inhabited. Hills on the three major islands reach heights of 1,000 to 1,550 feet (300 to 472 meters) or more above sea level. Many bays and inlets cut into the coasts of the islands. Fossils of ancient animals show that the sea once covered the Virgin Islands. The composition of the rocks that form much of the land suggests that volcanoes pushed the islands up from the ocean floor. Some tiny islets are mere rocks jutting from the water. Plant life grows on other islets.



The Virgin Islands are part of the Leeward Islands in the Lesser Antilles. The United States and Great Britain each control about half of the Virgin Islands.

WORLD BOOK maps



St. Croix—pronounced *saynt kroy*—(pop. 67,000), the largest of the islands, lies about 40 miles (64 kilometers) south of St. Thomas. It covers 82 square miles (212 square kilometers) and makes up about two-thirds of the island group's area. Tourism is the chief industry. Christiansted and Frederiksted are the island's only cities. Spanish-speaking people call St. Croix *Santa Cruz*, the name Christopher Columbus gave it.

St. John (pop. 3,000) lies 2 miles (3 kilometers) east of St. Thomas, and less than 1 mile (1.6 kilometers) from British Tortola. It covers 19 square miles (49 square kilometers). The Virgin Islands National Park spreads over about three-fourths of the island (see VIRGIN ISLANDS NATIONAL PARK). Villages are at Cruz Bay and Coral Bay, and tourist developments operate along Caneel Bay. Most of the people live on small plots of land, and raise just enough fruits and vegetables to feed themselves. The islanders make charcoal and pick bay leaves, which are made into bay rum (see BAY RUM).

St. Thomas (pop. 66,000) covers 27 square miles (70 square kilometers). Its central range of hills offers lovely views of the ocean. Crown Mountain, the highest point in the entire group, rises 1,556 feet (474 meters) above sea level. The only city on the island is Charlotte Amalie, the capital of the Virgin Islands. The harbor at Charlotte Amalie provides safe anchorage for even the largest ships. Most of the people depend on tourists for their income.

Natural Resources of the Virgin Islands cannot support the people, who must depend on the United States for most of their products. But the excellent climate, attractive beaches, and lovely scenery make the islands a favorite with vacationers. Tropical flowers and trees flourish, including the bougainvillea, canaria, flame tree, and hibiscus. The seas abound with fish, but most of them are not suitable for commercial fishing. The

FACTS IN BRIEF

Capital: Charlotte Amalie (since 1917).

Government: *Territorial Legislature*—a one-house legislature of 15 senators.

Area: 133 sq. mi. (344 km²). *Coastline*—117 mi. (188 km).

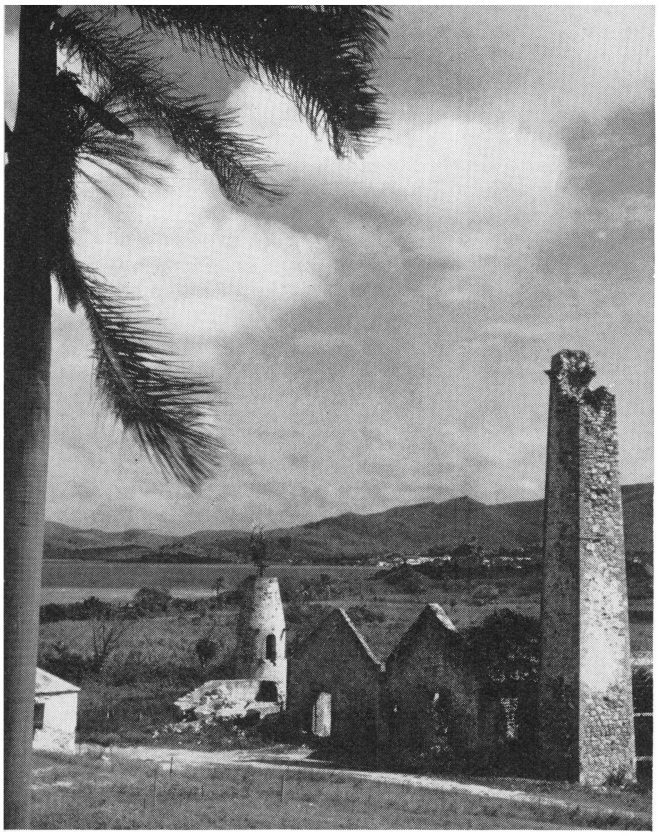
Elevation: *Highest*—Crown Mt. on St. Thomas, 1,556 ft. (474 m) above sea level; *Lowest*—sea level along the coasts.

Population: *Estimated 1976 Population*—136,000; distribution, 60 per cent urban, 40 per cent rural; density, 940 persons per sq. mi. (363 per km²). *1970 Census*—62,468. *Estimated 1981 Population*—195,000.

Chief Products: *Agriculture*—beef cattle, cucumbers, eggs, hogs, milk, sheep. *Manufacturing and Processing*—concrete, gypsum, and plaster products; food and food products; watches and clocks.

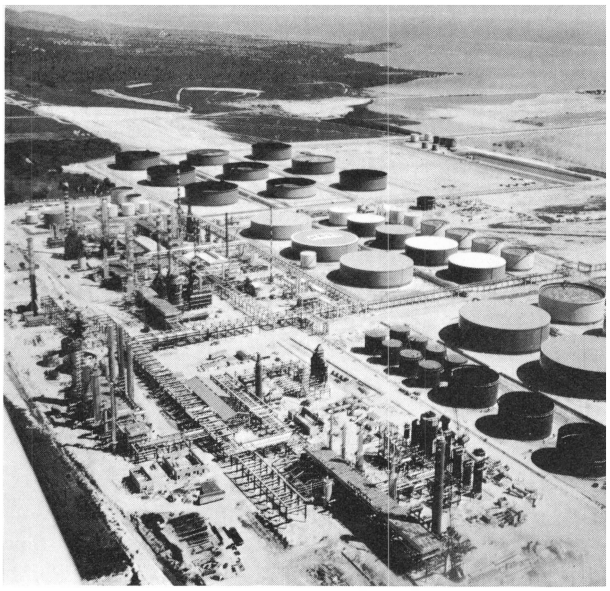
Territorial Seal: The coat of arms of the United States, with the American eagle and the shield of the United States, lies in the center of the seal. The words "Government of the Virgin Islands of the United States" encircle the coat of arms. Adopted in 1917.

Territorial Flag: A golden American eagle with the shield of the United States on its breast appears on a white field. The eagle holds a sprig of green laurel in its right talon, and a bundle of blue arrows in its left talon. The blue letters *V* and *I* are to the left and right of the eagle. Adopted in 1917. See FLAG (color picture: Flags of the States and Territories).



Fritz Henle

Scenic Ruins of Princess Plantation, an old sugar-cane farm, are a landmark on St. Croix, the largest island.



Fritz Henle, Photo Researchers

An Oil Refinery on St. Croix Island is one of many new industrial plants that have been built in the Virgin Islands.

Virgin Islands have no minerals of commercial value.

Climate. The Virgin Islands have a delightful tropical climate the year around. The growing season never ends. Trade winds blow over the islands most of the year, and there are no extremes of heat or cold. The temperature ranges from 70° to 90° F. (21° to 32° C), and averages 78° F. (26° C). The islands receive from 40 to 60 inches (100 to 150 centimeters) of rainfall a year. The amount of rainfall varies widely from island to island, and higher elevations may get from 50 to 60 inches (130 to 150 centimeters) of rainfall a year. The heaviest rains generally occur in spring and fall.

The People

The 1970 United States Census reported that the Virgin Islands had a population of 62,468. By 1976, the population had increased to about 136,000. Of every 100 islanders, 64 are Negro and 17 are white. The rest are of mixed race or belong to other races. Of every 100 islanders, 63 were born in the Virgin Islands, 12 in Puerto Rico, and 8 in the continental U.S. The rest moved there from other countries. The largest religious groups include Episcopalians, Lutherans, Methodists, Moravians, and Roman Catholics.

Virgin Islanders speak and read English. They speak in a soft drawl, and tend to simplify English grammar. For example, an islander says "we' en ga" for "we haven't got."

Charlotte Amalie (pop. 12,220), the capital and largest city in the Virgin Islands, serves as the tourist center of St. Thomas. The city's excellent harbor makes it the chief trade center of the entire group. Frederiksted (pop. 1,531) is a St. Croix trade center. Christiansted (pop. 3,020) serves as the local government center on St. Croix. The islands also have several small villages.

Work of the People

The Tourist Industry is the Virgin Islands' major industry. More than 1 million tourists visit the islands each year, and they add about $110 million to the economy of the islands annually. Visitors enjoy excellent bathing beaches, fishing, hotels, restaurants, and shops. Ruins of castles and forts built by pirates during the 1700's are also popular. A popular event is the carnival held on St. Thomas at the end of April.

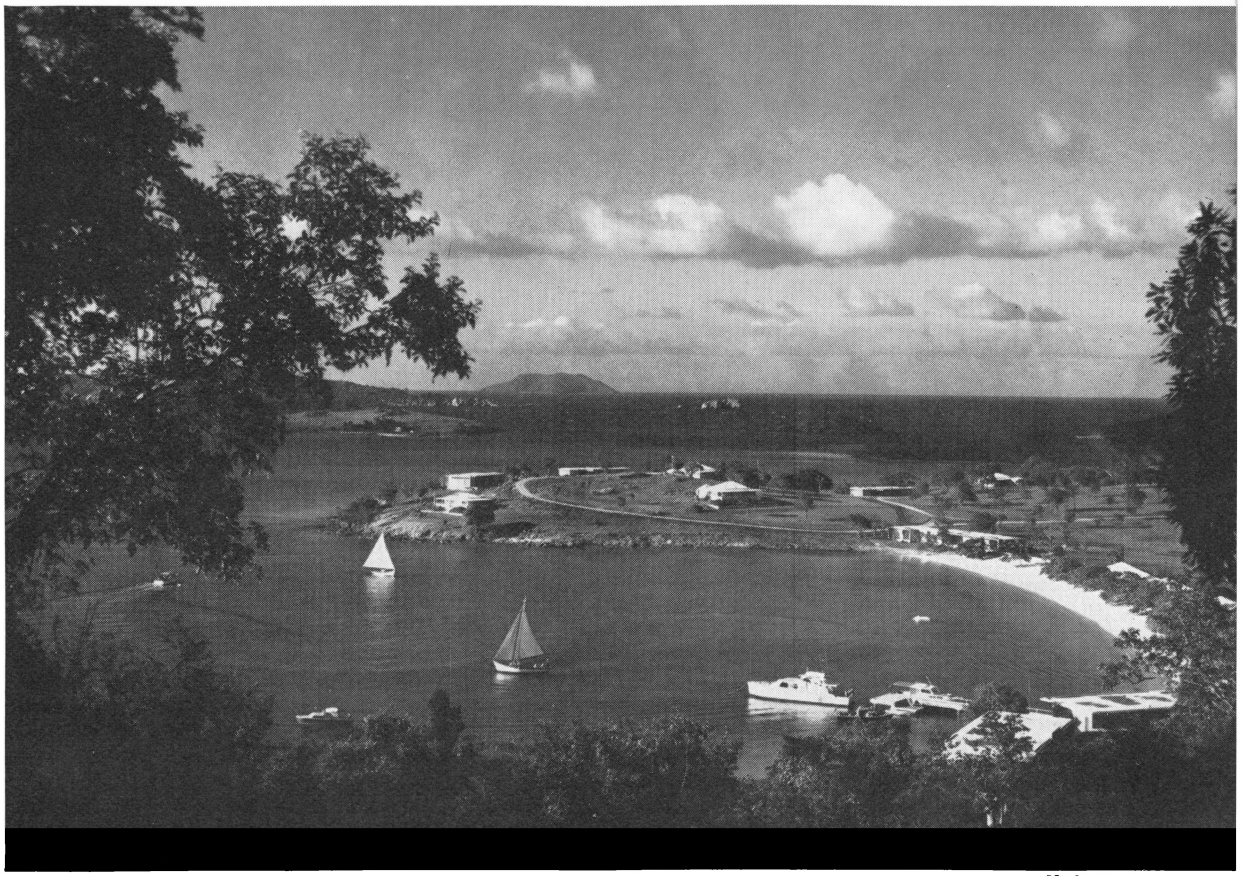
Manufacturing. Three distilleries on the islands produce rum. Excise taxes on exported rum provide over $11 million for the U.S. Treasury annually.

Many new industries have been started on the islands. These include an aluminum ore refining plant, an oil refinery, a knitting mill, watch assembly plants, and clothing factories. Watch movements, petroleum products, and refined bauxite are among the major exports. Most exports are shipped to the United States.

Agriculture. Most of the food Virgin Islanders eat must be imported. But there is some farm income from beef cattle, dairy herds, hogs, pigs, and sheep. Eggs are a leading farm product on the islands. There are slaughterhouses on St. Croix and St. Thomas. Farmers grow such vegetables as cucumbers, peppers, and tomatoes. Farmers also grow fruits and raise nuts. Grain sorghum is grown for the feeding of livestock.

Transportation. Three airlines fly from the United States to the Virgin Islands. Several airlines offer service among the islands. About 20 steamship lines serve Charlotte Amalie, Frederiksted, and Christiansted. About 4,500 freighters and liners dock at island ports each year. St. Croix and St. Thomas have paved roads. The Virgin Islands are the only U.S. possession where motorists drive on the left side of the road.

Communication. The four newspapers published in the Virgin Islands are the *Daily News* and the *Home Journal* on St. Thomas and the *St. Croix Avis* and the *West End News* on St. Croix. The islands have daily air-



Monkmeyer

Resort Cabins Edge Many Beaches of the Virgin Islands. Thousands of Americans visit the islands every year, attracted by the warm climate, picturesque scenery, and fine fishing.

mail service and a local telephone system. Telephone cables connect the group with Puerto Rico and the United States mainland. The Virgin Islands also have radio-telegraph service to all parts of the world. St. Croix and St. Thomas have radio and television stations.

Education

The public school system of the Virgin Islands provides education from kindergarten through high school. A nine-man Insular Board of Education supervises the system, which includes about 40 schools and more than 13,000 students. About 98 of every 100 persons can read and write. Children must attend school between the ages of $5\frac{1}{2}$ and 16. The College of the Virgin Islands is the only institution of higher education. It has campuses on St. Thomas and St. Croix.

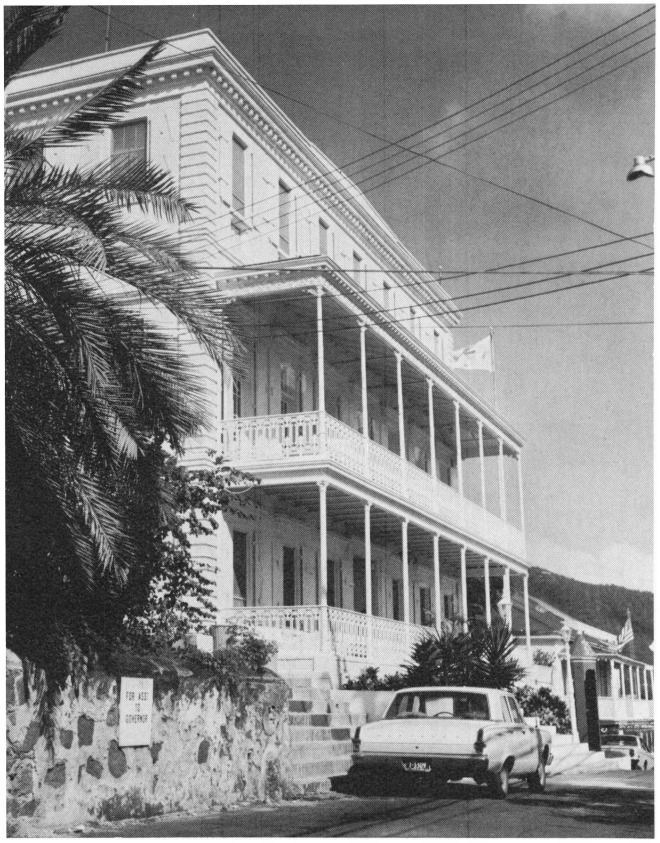
Four public libraries operate in the islands, at Charlotte Amalie, Christiansted, Cruz Bay, and Frederiksted. The islands also have two museums. The Virgin Islands Museum is in Charlotte Amalie and the St. Croix Museum stands in Christiansted.

Government

The Virgin Islands are administered by the United States Department of the Interior. The Revised Organic Act of the Virgin Islands, passed by Congress in 1954, serves as the constitution. The Department of the Interior administers the group through a governor elected by the people for a four-year term. The governor may not serve more than two terms in a row.

The territorial legislature consists of a *unicameral* (one-house) body of 15 members called *senators*. The people elect the senators to two-year terms. St. Croix elects six senators, St. Thomas and St. John elect seven, and two are elected at large. The governor may veto any bills, but his veto may be overridden by a two-thirds majority of the legislature. The legislature meets at Charlotte Amalie on the second Monday in January for a 60-day session. The governor may also call special sessions of the legislature.

A federal district court known as the District Court of the Virgin Islands heads the judicial system of the islands. This court has jurisdiction over certain local affairs as well as in federal cases. The President appoints the court's single judge with the advice and consent of the U.S. Senate. The judge of the federal district court serves an eight-year term. The governor of the Virgin Islands appoints municipal court judges to four-year terms. These appointments require the advice and consent of the territorial legislature. All residents who are 18 years of age or older and are U.S. citizens may vote in local elections. The islanders send a nonvoting



Virgin Islands Government Office of Public Relations and Information

Government House at Charlotte Amalie on St. Thomas Island serves as the administrative headquarters of the Virgin Islands. The governor lives and works here.

representative to the U.S. Congress. They cannot vote in national elections of any kind.

History

Exploration. Christopher Columbus sighted the Virgin Islands in 1493, during his second voyage to the Americas. Warlike, cannibalistic Carib Indians lived on the islands at that time. They fought with members of Columbus' crew at Sugar Bay on St. Croix. The Caribs continued to attack Europeans throughout the 1500's and most of the 1600's. In the mid-1500's, King Charles I of Spain ordered his soldiers to kill the Indians and take their lands. All the Indians had died or left the Virgin Islands by the time the British and Danes began settlement in the 1600's. See CARIB INDIANS.

Early Settlement. A group of English settlers visited the Virgin Islands in 1607 on their way to establish a colony in Jamestown, Va. The Spaniards used the islands as a place to hide their treasure ships from pirates, but never settled there. No Europeans attempted settlement until 1625, when Dutch and English settlers landed on St. Croix. They lived there until the mid-1600's, when Spaniards from Puerto Rico drove them out. Within 20 years, the Spaniards were driven out by the French. The French controlled the island until 1733, when they sold it to the Danes for $150,000.

The Danes formally claimed St. Thomas in 1666 by establishing a settlement on the island. Eric Smidt was named the first governor, but his colony failed. The Danish people made no new settlement on St. Thomas until 1672. In 1717, the Danes settled on St. John.

The Danish West Indies, which included St. Croix, St. John, and St. Thomas, remained under Danish control during most of the years until 1917. They surrendered twice to the British during the Napoleonic Wars. The British quartered thousands of English-speaking soldiers and sailors on the islands during the second British occupation, from 1807 to 1815. They established English as the common language of the people.

Commercial Development. The Danish West India Company controlled the development of the Virgin Islands for the first hundred years of Danish rule. The Danes made St. Thomas a free port in an effort to develop the islands into an important trade center (see FREE PORT). In the early 1700's, landowners used slave labor in developing sugar and cotton plantations.

A bloody slave uprising in 1733 destroyed St. John's economic prospects, because other countries feared using the island's trade facilities. This revolt caused the Danes to increase military authority in the group. An uprising on St. Croix in 1848 caused immediate abolition of slavery on July 3, 1848. Continued efforts by the Danes to develop the islands proved unsuccessful.

On Aug. 4, 1916, Denmark and the United States signed a treaty transferring control of the Virgin Islands to the United States. The treaty was formally ratified on Jan. 17, 1917. Actual control of the islands was transferred on March 31, 1917. The United States paid Denmark $25 million for the islands. James H. Oliver served as the territory's first governor.

Progress Under the United States. In 1927, Congress passed a law making the people of the Virgin Islands citizens of the United States. In 1936, persons who could read and write English were granted the right to vote in local elections. At the close of World War II, the United States set aside $10 million for the further development of the islands. Projects included schools, hospitals, roads, and sewerage and water systems.

Congress passed the Revised Organic Act of the Virgin Islands in 1954. It provided for a regular legislature to replace the legislative assembly. In 1956, Congress established the Virgin Islands National Park on St. John. Buck Island Reef National Monument was established near St. Croix in 1961. During the 1960's, the government built health centers, houses, and schools.

In 1958, John D. Merwin became the first native-born governor of the islands. Ralph M. Paiewonsky, also native-born, succeeded him in 1961. Paiewonsky resigned in 1969, and Melvin H. Evans became the first native-born Negro governor. In 1968, Congress passed a law giving the people the right to elect their own governor. The voters elected Evans in 1970. Cyril E. King won election in 1974. RALPH M. PAIEWONSKY

Related Articles in WORLD BOOK include:

Bay Rum
Buck Island Reef National Monument
Caribbean Sea
Charlotte Amalie
Frederiksted
Virgin Islands National Park
West Indies

Outline

I. The Land and Its Resources
A. Location and Size
B. Islands
C. Natural Resources
D. Climate
II. The People
III. Work of the People
A. The Tourist Industry
B. Manufacturing
C. Agriculture
D. Transportation

E. Communication
IV. Education
V. Government
VI. History

Questions

Of what important military value were the Virgin Islands to the United States during World War II?

How does automobile driving in the Virgin Islands differ from that in the United States?

Who was the first white man to see the Virgin Islands?

How do the Virgin Islands compare in size with the smallest American state?

How did the Virgin Islands receive their name?

For what is each major island important?

When did the people of the Virgin Islands become citizens of the United States?

What industry provides the largest source of income?

When did Denmark establish its first permanent colony in the Virgin Islands? Where?

Taxes on what product have paid for the original cost of the Virgin Islands?

VIRGIN ISLANDS, BRITISH, are a dependency of Great Britain in the West Indies. They lie near the western end of the Lesser Antilles (see ANTILLES). A channel called *the Narrows* separates the group from The Virgin Islands of the United States (see VIRGIN ISLANDS [map]). The islands cover 59 square miles (153 square kilometers) and have a population of 14,000. The group consists of 32 small islands, the largest of which are Anegada, Jost van Dyke, Tortola, and Virgin Gorda islands. Road Town (pop. 2,183) is the capital and only urban area. Major products include beef cattle, fish, fruits and vegetables, and rum. See also BRITISH WEST INDIES; WEST INDIES. J. ANTONIO JARVIS

VIRGIN ISLANDS NATIONAL PARK lies chiefly on St. John, the smallest of the three chief American-owned Virgin Islands in the Caribbean Sea. The park was authorized on Aug. 2, 1956. Laurance S. Rockefeller donated over 5,000 acres (2,000 hectares) for it.

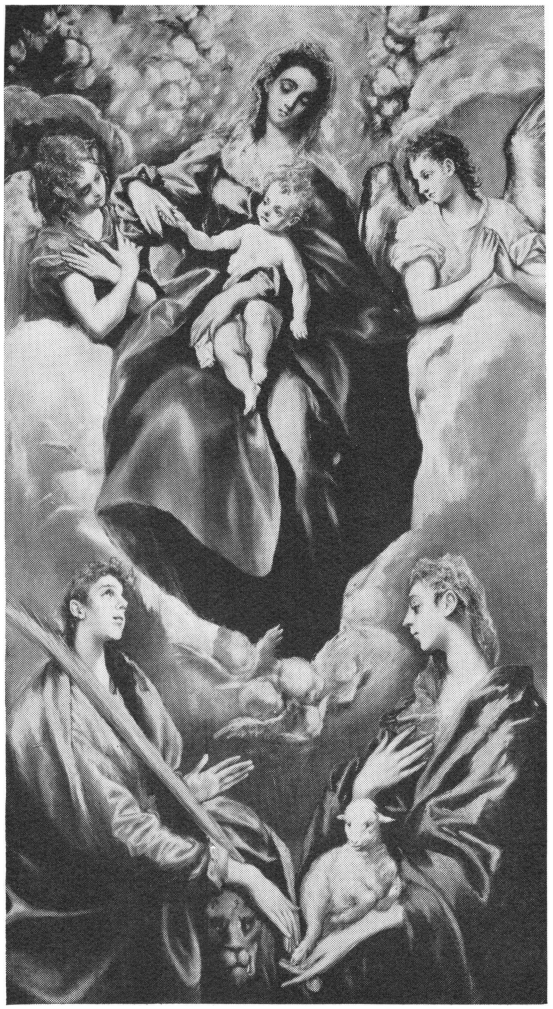
The park covers about 14,500 acres (5,900 hectares). It occupies two-thirds of St. John, 15 acres (6 hectares) on St. Thomas Island, and 5,650 acres (2,286 hectares) of waters and smaller islands. Lush tropical vegetation grows throughout the park. The rugged land rises to 1,277 feet (389 meters) at Bordeaux Peak.

Mules and jeeps provide the chief methods of transportation. The park is reached by a 2½-mile (4-kilometer) ferry trip from eastern St. Thomas Island across Pillsbury Sound to Cruz Bay, the main village on St. John. Tourist facilities are limited, but camp grounds, hotels, and cottage colonies are planned.

Virgin Islands National Park has many reminders of the Danish occupation of St. John, which lasted from the 1700's to 1917. Remains of Danish sugar mills and lavish plantations can be found. OTIS P. STARKEY

VIRGIN MARY was the mother of Jesus. Her family lived quietly and humbly in Nazareth. She gave birth to Jesus in a stable at Bethlehem. She had gone there with her husband, Joseph, to have their names put down as members of the House of David. This was the way the census was taken at that time.

The sufferings of Jesus brought great sorrow into Mary's life. At the Crucifixion, He asked His beloved disciple, John, to take care of her. Little is known about her later life. It is believed that she died in Jerusalem about A.D. 63. She is venerated by the Roman Catholic, Anglican, and Eastern Orthodox churches as the Mother of God.



National Gallery of Art, Washington, D.C., Widener Collection

The Virgin with Saint Inés and Saint Tecla, **painted by El Greco, shows a contrast between the Virgin Mary's flowing dark robe and the faintly flushed skin of the Child Jesus.**

The story of Mary has always been a favorite subject of artists and musicians. Many great paintings and songs have been based on the incidents and traditions of her life. FREDERICK C. GRANT and FULTON J. SHEEN

Related Articles in WORLD BOOK include:

Anne, Saint	Christmas	Joseph
Annunciation	Immaculate Conception	Madonna and Child
Assumption	Jesus Christ	Our Lady of Fatima
Ave Maria		

VIRGIN OF GUADALUPE. See MEXICO (Religion).

VIRGINAL is an ancient keyboard instrument in which small pieces of quill or leather pluck a set of strings. It usually has a rectangular case, with the keyboard on the longer side. The virginal has a light, clear, and somewhat tinkling tone. It was particularly popular as a solo instrument in Elizabethan England. Leading composers of the times wrote for it. The *Fitzwilliam Virginal Book*, assembled around 1625 and containing nearly 300 numbers, is the most important collection of music for virginals. KARL GEIRINGER

Jack Zehrt, FPG

George Washington's Home at Mount Vernon

VIRGINIA

The Mother of Presidents

VIRGINIA is perhaps the most historic of all the 50 states. Some of the most important events in American history took place there. The first permanent English settlement in America was made at Jamestown in 1607. In 1619, the Jamestown colonists established the first representative legislature in America. Some of the greatest battles of the Revolutionary War and Civil War were fought in Virginia. American independence from Great Britain was assured when George Washington forced Lord Cornwallis to surrender at Yorktown in 1781. The Civil War ended when the Confederate forces surrendered at Appomattox in 1865.

Virginia was named for Queen Elizabeth I of England, the *Virgin Queen*. Historians think the English adventurer Sir Walter Raleigh suggested the name about 1584. That year, Elizabeth gave Raleigh permission to colonize the Virginia region. Virginia is also known as the *Old Dominion*. King Charles II gave it this name because it remained loyal to the crown during the English Civil War of the mid-1600's. Virginia is one of four states officially called *commonwealths*. The others are Kentucky, Massachusetts, and Pennsylvania.

Virginia has the nickname *Mother of Presidents* because eight U.S. Presidents were born there. They include four of the first five Presidents—George Washington, Thomas Jefferson, James Madison, and James Monroe. Other Presidents born in Virginia were William Henry Harrison, John Tyler, Zachary Taylor, and Woodrow Wilson. Virginia also has the nickname *Mother of States*. All or part of eight other states were formed from western territory once claimed by Virginia. These states are Illinois, Indiana, Kentucky, Michigan, Minnesota, Ohio, West Virginia, and Wisconsin.

Tourists from all parts of the United States come to Virginia to see its battlefields, famous old churches, colonial homes, and other historic sites. Famous homes include George Washington's Mount Vernon, Thomas Jefferson's Monticello, and George Mason's Gunston Hall. The Tomb of the Unknown Soldier and the grave of President John F. Kennedy are in Arlington National Cemetery. The cemetery surrounds the mansion of Robert E. Lee and his wife, Mary Custis Lee. Williamsburg, Virginia's second colonial capital, has been restored to look as it did in the 1700's. Antique furnishings, horse-drawn carriages, and guides in colonial costumes add to the historic atmosphere.

Many tourists also come to see Virginia's beautiful scenery. The Skyline Drive along the top of the Blue Ridge offers spectacular views of the Shenandoah Valley. In this fertile valley, General Thomas J. "Stonewall" Jackson won victories over Union armies during the Civil War. Virginia's natural wonders include the Natural Bridge, Natural Chimneys, Natural Tunnel, and many large caves and caverns.

Tobacco has been a leading crop in Virginia since John Rolfe first planted it in early colonial days. Virginia also ranks high among the states in raising apples, broiler chickens, peanuts, and turkeys. Virginia is famous for its Smithfield hams.

Virginia is an outstanding example of the industrialization of the South in modern times. Factories produce chemicals, electrical equipment, textiles, and tobacco products. Shipyards in the Hampton Roads area build ships for the U.S. Navy and for commercial use.

Richmond, the capital of the Confederacy from May, 1861, to April, 1865, is Virginia's capital. Norfolk is the largest city. For the relationship of Virginia to other states in its region, see SOUTHERN STATES.

Jack Zehrt, FPG

Springtime in the Blue Ridge Mountains

The contributors of this article are Raymond C. Dingledine, Jr., Head of the History Department at Madison College; John E. Leard, Executive Editor of the Richmond Times-Dispatch and News Leader; *and Anthony Sas, Associate Professor of Geography at the University of South Carolina (formerly of Madison College).*

Virginia (blue) ranks 36th in size among all the states, and 9th in size among the Southern States (gray).

Fox Hunting in Northern Virginia

John Freeman, Publix

FACTS IN BRIEF

Capital: Richmond.

Government: *Congress*—U.S. senators, 2; U.S. representatives, 10. *Electoral Votes*—12. *State Legislature*—senators, 40; delegates, 100. *Counties*—95.

Area: 40,817 sq. mi. (105,716 km²), including 1,037 sq. mi. (2,686 km²) of inland water but excluding 1,511 sq. mi. (3,913 km²) of Chesapeake Bay; 36th in size among the states. *Greatest Distances*—east-west, 452 mi. (727 km); north-south, 209 mi. (336 km). *Coastline*—112 mi. (180 km).

Elevation: *Highest*—Mount Rogers in Grayson and Smyth counties, 5,729 ft. (1,746 m) above sea level. *Lowest*—sea level.

Population: *Estimated 1975 Population*—4,936,000; 13th among the states; distribution, 63 per cent urban, 37 per cent rural; density, 121 persons per sq. mi. (47 persons per km²). *1970 Census*—4,648,494.

Chief Products: *Agriculture*—apples, beef cattle, broilers, corn, dairy products, eggs, hogs, peanuts, soybeans, tobacco, turkeys. *Fishing*—clams, crabs, flounder, menhaden, oysters, scallops. *Manufacturing and Processing*—chemicals and related products, electrical equipment, furniture and fixtures, paper and paper products, processed foods, textiles, tobacco products, transportation equipment. *Mining*—clay, coal, sand and gravel, stone, zinc.

Statehood: June 25, 1788, the 10th state.

State Motto: *Sic Semper Tyrannis* (Thus always to tyrants).

State Song: "Carry Me Back to Old Virginia." Words and music by James A. Bland.

Constitution of Virginia became effective in 1971. The state had five earlier constitutions, which went into effect in 1776, 1830, 1851, 1870, and 1902.

Constitutional amendments may be proposed in either house of the legislature. To become law, they must be approved by a majority of both houses in two successive sessions. Then they must be approved by a majority of persons who vote on the issue. The constitution may also be amended by a constitutional convention. Such a convention is called by a majority of the legislature with the approval of a majority of the voters.

Executive. The governor is elected to a four-year term. He cannot serve two terms in a row. He receives a yearly salary of $35,000. For a list of all the governors of Virginia, see the *History* section of this article.

The lieutenant governor also is elected to a four-year term. The governor appoints almost all the top state officials, including the secretary of the commonwealth, adjutant general, treasurer, and comptroller. These officials serve varying terms. The people elect the attorney general to a four-year term. The legislature elects the auditor, who serves a four-year term.

Legislature of Virginia is called the *General Assembly*. It is the oldest representative legislature in America. It traces its history to the House of Burgesses, formed in 1619 (see HOUSE OF BURGESSES).

The General Assembly consists of a 40-member Senate and a 100-member House of Delegates. Voters in 37 of the state's 38 senatorial districts elect one senator. The people in the remaining district—which covers Norfolk and part of Virginia Beach—elect three senators. Voters in each of the 52 delegate districts elect from one to seven delegates, depending on population. Senators serve four-year terms, and delegates serve two-year terms.

The General Assembly holds regular sessions every year. Sessions begin on the second Wednesday in January. They last up to 60 days in even-numbered years and up to 30 days in odd-numbered years. The governor may call special sessions.

By law, the legislature must *reapportion* (redivide) itself the year after each U.S. census. The redistricting is designed to provide equal representation based on population.

Courts. The state's highest court is the Supreme Court of Virginia. It has seven justices, who are elected by the General Assembly to 12-year terms. The justice who has served longest becomes chief justice for the rest of his term.

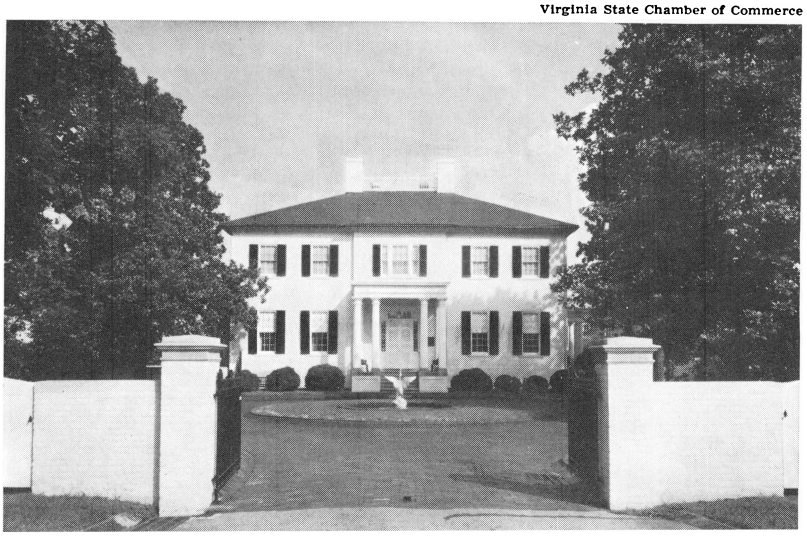
Circuit courts are the next highest courts in Virginia. The judges of these courts are elected by the General Assembly to eight-year terms. Lower courts in Virginia include juvenile courts, domestic relations courts, and general district courts. The judges of most of these courts are appointed by the circuit courts to four-year terms. In some cities and towns, the judges are elected to four-year terms.

Local Government. Virginia has 95 counties. Each county except Arlington is governed by a board of supervisors. Arlington has a county board. In most counties, voters elect other officials, including a commissioner of revenue, treasurer, sheriff, commonwealth's attorney, and county clerk. The clerk has an eight-year term. Other officials serve four-year terms. A few counties have a county-manager or county-executive government. In these Virginia counties, a county manager or the board of supervisors appoints executive officials.

Any Virginia town with 5,000 or more persons may become an independent city if the people so wish. Virginia has 38 independent cities. Unlike the cities of most other states, these 38 cities are legally separate from the counties in which they are located. One of the first forms of council-manager government in a U.S. city was established in Staunton in 1908. Today, all Virginia cities have council-manager governments. Some towns in Virginia have council-manager governments, and the others have mayor-council governments.

Taxation. Taxes and license fees bring in about three-fifths of the state government's income. Virginia collects taxes on motor fuels, and on individual and corporation incomes. It also receives money from the sale of alcoholic beverages in state-owned stores. A general sales tax went into effect in 1966. The federal government provides about 20 per cent of the state's revenue. This money comes in the form of grants and other assistance programs.

Virginia State Chamber of Commerce



Governor's Mansion in Richmond stands northeast of the Capitol. The Federal-style brick home was built in 1813. It replaced an earlier governor's residence built on the same site.

The State Seal

Symbols of Virginia. On the front of the seal, the standing figure represents Virtue dressed as a woman warrior. She is triumphant over Tyranny. The Latin motto means "Thus always to tyrants." On the back of the seal, the figures represent, *left to right,* eternity, liberty, and agriculture. The Latin motto means "By persevering." George Wythe, a signer of the Declaration of Independence, designed the seal. It was first adopted in 1776. The present version was authorized in 1930. The flag probably was first used in the mid-1800's, but it was not adopted until 1930.

Flag and flower illustrations, courtesy of Eli Lilly and Company; seal, WORLD BOOK illustration

The State Flag

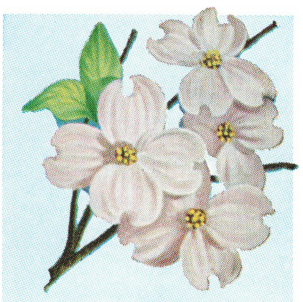
Politics. The Democratic Party has controlled Virginia politics throughout most of the state's history. In 1969, A. Linwood Holton became the first Republican to be elected governor in nearly 100 years.

Virginia Democrats are split into two groups. The larger, more conservative group was headed by Harry F. Byrd, former governor and U.S. senator, until he retired in 1965. Its members have been called "Byrd Democrats" (see BYRD, HARRY FLOOD). Members of the other group, often called "liberal Democrats," have their greatest strength in the urban areas of the north and the east. The conservative Democrats sometimes support Republican candidates in presidential elections. For this reason, Virginia has voted Republican in several national elections. For the state's voting record in presidential elections, see ELECTORAL COLLEGE (table).

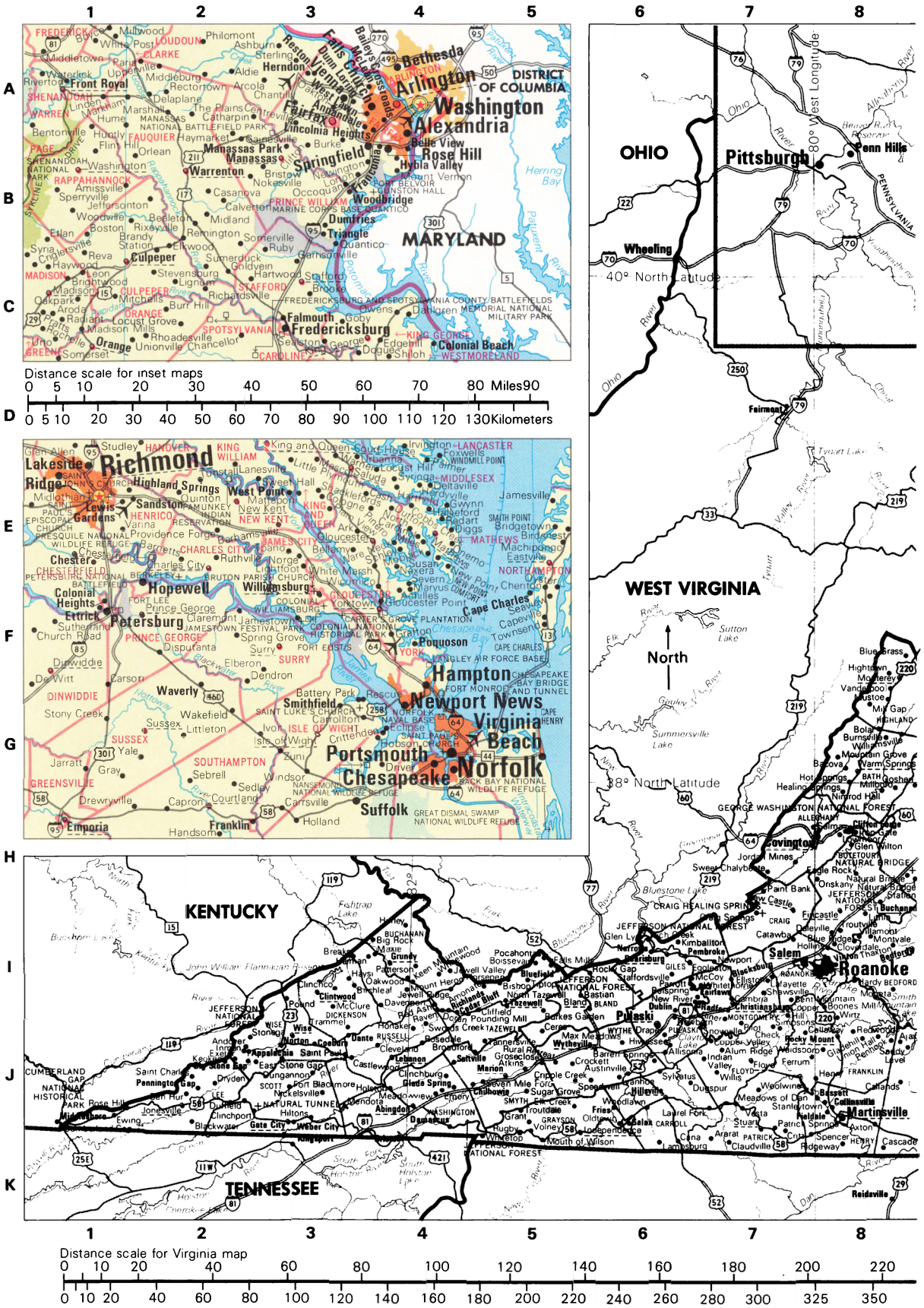
The State Bird
Cardinal

State Capitol in Richmond was designed by Thomas Jefferson. The original building was completed in 1792. The Capitol was modeled after a Roman temple in Nimes, France. The Confederate Congress met in the Capitol during the Civil War. Richmond has been the state capital since 1780. Earlier capitals were Jamestown (1607-1699) and Williamsburg (1699-1780).

Virginia Dept. of Conservation and Economic Development



The State Flower
Flowering Dogwood


OHIO
Pittsburgh
Penn Hills
80° West Longitude
Wheeling
40° North Latitude
Fairmont
WEST VIRGINIA
North
38° North Latitude
Covington
Salem
Roanoke
Pulaski
Martinsville
KENTUCKY
TENNESSEE
Richmond
Petersburg
Hopewell
Williamsburg
Cape Charles
Hampton
Newport News
Virginia Beach
Portsmouth
Norfolk
Chesapeake
Suffolk
Franklin
Emporia
Fredericksburg
Colonial Beach
Culpeper
Orange
Warrenton
Manassas
Manassas Park
Front Royal
Fairfax
Falls Church
Arlington
Bethesda
Washington
Alexandria
Springfield
Rose Hill
Woodbridge
Dumfries
Triangle
Quantico
MARYLAND
DISTRICT OF COLUMBIA
Distance scale for inset maps
0 5 10 20 30 40 50 60 70 80 Miles90
0 5 10 20 30 40 50 60 70 80 90 100 110 120 130Kilometers
Distance scale for Virginia map
0 10 20 40 60 80 100 120 140 160 180 200 220
0 10 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 325 350

VIRGINIA Political Map
National capital
State capital
Urban area in Virginia
Urban area outside Virginia
City or town
County seat
County name
County boundary
State boundary
Park or other recreation area
Forest or other conservation area
Military or other federal area
Indian reservation
Point of interest
Major airport
Water
River
Waterway
Intermittent lake
Tunnel
Highways:
Expressway
Other road
Interstate
U. S.
Other
Lambert conformal conic projection
WORLD BOOK map ©Field Enterprises Educational Corporation
PENNSYLVANIA
MARYLAND
WEST VIRGINIA
NEW JERSEY
DELAWARE
DISTRICT OF COLUMBIA
NORTH CAROLINA
Washington
Baltimore
Philadelphia
Richmond
Norfolk
Portsmouth
Virginia Beach
Newport News
Petersburg
Lynchburg
Charlottesville
Staunton
Waynesboro
Harrisonburg
Winchester
Fredericksburg
Alexandria
Arlington
Bethesda
Annapolis
Dundalk
Hagerstown
Cumberland
York
Lancaster
Chester
Wilmington
Camden
Dover
Johnstown
Danville
Suffolk
Williamsburg
Yorktown
Cape Charles
Eastville
Onancock
Chincoteague
Elizabeth City
Emporia
Clarksville
Kerr Reservoir
Hyco Lake
Roanoke Rapids Lake
Chesapeake Bay
Delaware Bay
North Atlantic Ocean
AREA OF INSET MAP
MASON NECK NATIONAL WILDLIFE REFUGE
MARCHBCO NATIONAL WILDLIFE REFUGE
MARINE CORPS BASE QUANTICO
SHENANDOAH NATIONAL PARK
GEORGE WASHINGTON NATIONAL FOREST
GEORGE WASHINGTON BIRTHPLACE NATIONAL MONUMENT
APPOMATTOX COURT HOUSE NATIONAL HISTORICAL PARK
FISHERMAN ISLAND NATIONAL WILDLIFE REFUGE
CHESAPEAKE BAY BRIDGE AND TUNNEL
OCEANA NAVAL AIR STATION
BACK BAY NATIONAL WILDLIFE REFUGE
MACKAY ISLAND NATIONAL WILDLIFE REFUGE
GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE
ASSATEAGUE ISLAND NATIONAL SEASHORE
CHINCOTEAGUE NATIONAL WILDLIFE REFUGE
PLUM TREE ISLAND NATIONAL WILDLIFE REFUGE
SHIP SHOAL ISLAND
POINT LOOKOUT
Miles
Kilometers

Population

4,936,000 Estimate..1975
4,648,494 ..Census..1970
3,966,949 .....“.....1960
3,318,680 .....“.....1950
2,677,773 .....“.....1940
2,421,851 .....“.....1930
2,309,187 .....“.....1920
2,061,612 .....“.....1910
1,854,184 .....“.....1900
1,655,980 .....“.....1890
1,512,565 .....“.....1880
1,225,163 .....“.....1870
1,219,630 .....“.....1860
1,119,348 .....“.....1850
1,025,277 .....“.....1840
1,044,054 .....“.....1830
938,261 .....“.....1820
877,683 .....“.....1810
807,557 .....“.....1800
691,737 .....“.....1790

Metropolitan Areas

Kingsport (Tenn.)-Bristol .....241,154 (161,086 in Tenn.; 80,068 in Va.)
Lynchburg 133,258
Newport News-Hampton 333,140
Norfolk-Virginia Beach-Portsmouth .....732,600 (725,624 in Va.; 6,976 in N.C.)
Petersburg-Colonial Heights-Hopewell 128,809
Richmond 542,242
Roanoke 203,153
Washington, D.C. .....2,909,355 (1,231,569 in Md.; 921,276 in Va.; 756,510 in D.C.)

Counties

Accomack ..29,004..H 15
Albemarle .37,780..G 10
Alleghany ..12,461..H 8
Amelia .....7,592..I 11
Amherst ...26,072..H 9
Appomattox .9,784..I 10
Arlington .174,284..E 13
Augusta ...44,220..G 9
Bath .....5,192..G 8
Bedford ...26,728..I 8
Bland .....5,423..I 6
Botetourt ..18,193..H 8
Brunswick .16,172..J 12
Buchanan ..32,071..I 4
Buckingham .....10,597..H 10
Campbell ..43,319..I 9
Caroline ...13,925..G 13
Carroll .....23,092..J 6
Charles City .6,158..I 13
Charlotte ..12,366..J 10
Chesterfield 77,045..I 12
Clarke .....8,102..E 11
Craig .....3,524..I 7
Culpeper ...18,218..F 11
Cumberland .6,179..H 11
Dickenson .16,077..I 3
Dinwiddie .25,046..I 12
Essex .....7,099..G 13
Fairfax ...455,032..F 12
Fauquier ..26,375..E 11
Floyd .....9,775..J 7
Fluvanna ...7,621..H 11
Franklin ..28,163..J 8
Frederick ..28,893..E 11
Giles .....16,741..I 6
Gloucester .14,059..I 14
Goochland .10,069..H 11
Grayson ...15,439..J 5
Greene .....5,248..G 10
Greensville ..9,604..J 12
Halifax ....30,076..J 10
Hanover ...37,479..H 12
Henrico ...154,364..I 12
Henry .....50,901..K 8
Highland ...2,529..G 8
Isle of Wight ...18,285..J 14
James City .17,853..I 13
King and Queen .....5,491..H 14
King George 8,039..G 13
King William ..7,497..H 13
Lancaster ....9,126..H 14
Lee .....20,321..J 2
Loudoun ...37,150..E 12
Louisa .....14,004..G 11
Lunenburg .11,687..J 11
Madison ....8,638..F 11
Mathews ....7,168..H 14
Mecklenburg 29,426..J 10
Middlesex ...6,295..H 14
Montgomery 47,157..J 7
Nelson .....11,702..H 9
New Kent ..5,300..H 13
Northampton ..14,442..I 15
Northumberland .....9,239..H 14
Nottoway ...14,260..I 11
Orange .....13,792..G 11
Page .....16,581..F 10
Patrick ....15,282..K 7
Pittsylvania 58,789..J 9
Powhatan ...7,696..H 11
Prince Edward ..14,379..I 10
Prince George ...29,092..I 13
Prince William 111,102..F 12
Pulaski ....29,564..J 6
Rappahannock ..5,199..F 11
Richmond ..6,504..G 13
Roanoke ...67,339..I 7
Rockbridge .16,637..G 9
Rockingham 47,890..F 9
Russell ....24,533..J 4
Scott .....24,376..J 3
Shenandoah 22,852..E 10
Smyth .....31,349..J 5
Southampton ..18,582..J 13
Spotsylvania .16,424..G 12
Stafford ...24,587..F 12
Surry .....5,882..I 13
Sussex .....11,464..J 13
Tazewell ...39,816..J 5
Warren ....15,301..E 11
Washington 40,835..J 4
Westmoreland .....12,142..G 13
Wise .....35,947..J 3
Wythe .....22,139..J 6
York .....33,203..I 14

Cities and Towns

Abingdon ...4,376.°J 4
Accomac .....373.°H 16
Achilles .....F 4
Afton .....G 10
Alberta .....466..J 12
Aldie .....A 2
Alexandria ....110,927†.E 13
Alfonso .....H 14
Allisonia .....J 6
Altavista ...2,708..I 9
Alton .....K 9
Alum Ridge .....J 7
Amelia Court House .....°I 11
Amherst ....1,108.°H 9
Amissville .....B 1
Ammon .....I 12
Amonate .....I 5
Andersonville .....I 10
Andover .....J 2
Annandale .27,405..A 3
Appalachia .2,161..J 2
Appomattox .1,400.°I 10
Ararat .....K 7
Arcola .....A 3
Ark .....E 3
Arlington .174,284.°E 13
Aroda .....C 1
Arvonia .....H 11
Ashburn .....A 3
Ashland ....2,934..H 12
Atkins .....J 5
Atlantic .....G 16
Augusta Springs ...G 9
Austinville .....J 6
Axton .....J 8
Aylett .....H 13
Bacova .....G 8
Baileys Crossroads 7,295..A 4
Ballsville .....H 11
Barboursville .....G 11
Barhamsville .....E 3
Barnetts .....E 2
Barren Springs .....J 6
Baskerville .....J 11
Bassett .....3,058..J 8
Bastian .....I 5
Basye .....E 10
Batesville .....G 10
Battery Park .....G 3
Bealeton .....B 2
Beaverdam .....G 12
Bedford ....6,011†°I 8
Bellamy .....E 3
Belle Haven ..504..H 15
Belle View ..8,299..B 4
Belmont .....G 12
Belspring .....I 6
Ben Hur .....J 2
Bent Mountain .....I 7
Bentonville .....A 1
Bergton .....F 10
Berryville ...1,569.°E 11
Beulahville .....H 13
Big Island .....H 9
Big Rock .....I 4
Big Stone Gap .....4,153..J 2
Birchleaf .....I 3
Birdsnest .....E 5
Bishop .....I 5
Blackridge .....J 11
Blacksburg .9,384..I 7
Blackstone ..3,562..I 11
Blackwater .....J 2
Blairs .....J 9
Bland .....°I 6
Bloxom .....391..H 16
Blue Grass .....F 8
Blue Ridge .....I 8
Bluefield ...5,286..I 5
Bluemont .....E 12
Boissevain .....I 5
Bolar .....G 8
Bon Air* ..10,771..H 12
Boones Mill ..363..I 8
Boonesville .....G 10
Boston .....B 1
Bowling Green 528.°G 12
Boyce .....378..A 1
Boydton .....541.°J 11
Boykins .....742..K 13
Bracey .....K 11
Branchville ...189..K 13
Brandy Station ....B 2
Breaks .....I 3
Bremo Bluff .....H 11
Bridgetown .....E 5
Bridgewater .2,828..F 9
Brightwood .....C 1
Bristol ....14,857†.K 4
Bristow .....B 3
Broadford .....J 5
Broadway ....887..F 10
Brodnax .....569..J 11
Brooke .....C 3
Brookneal ...1,037..J 10
Brownsburg .....H 9
Brucetown .....D 11
Buchanan ..1,326..H 8
Buckingham .....°H 10
Buena Vista .6,425†.H 9
Buffalo Junction ...K 10
Bumpass .....G 12
Burgess .....H 14
Burke .....A 3
Burkes Garden .....I 5
Burkeville ....703..I 11
Burnsville .....G 8
Burr Hill .....C 2
Callands .....J 8
Callao .....G 14
Callaway .....J 8
Calverton .....B 2
Cambria .....I 7
Camp Barrett* ..1,076..F 12
Cana .....K 6
Cape Charles 1,689..I 15
Capeville .....F 5
Capron .....314..H 2
Cardinal .....E 4
Cardwell .....H 12
Carrollton .....G 3
Carrsville .....H 3
Carson .....F 1
Cartersville .....H 11
Casanova .....B 2
Cascade .....K 8
Cash .....E 4
Castlewood .....J 3
Catawba .....I 7
Catharpin .....A 2
Cauthornville .....H 13
Cedar Bluff .1,050..I 4
Center Cross .....H 14
Centreville .....A 3
Ceres .....J 5
Champlain .....G 13
Chancellor .....C 2
Chantilly .....A 3
Charles City .....°I 13
Charlotte Courthouse .539.°J 10
Charlottesville ....38,880†°G 10
Chase City ..2,909..J 10
Chatham ....1,801.°J 9
Check .....J 7
Cheriton .....655..F 5
Chesapeake 89,580†.J 15
Chester .....5,556..E 1
Chesterfield .....°I 12
Chilesburg .....G 12
Chilhowie ...1,317..J 5
Chincoteague 1,867..G 16
Christiansburg .....7,857.°I 7
Church Road .....F 1
Churchville .....G 9
Claremont ....383..F 2
Clarksville ..1,641..K 10
Claudville .....K 7
Clayville .....I 12
Clear Brook .....D 11
Cleveland .....357..J 4
Cliffield .....I 5
Clifford .....H 9
Clifton .....178..B 3
Clifton Forge .....5,501†.H 8
Clinchburg .....J 4
Clinchco .....I 3
Clinchport ....286..J 2
Clintwood ....1,320.°I 3
Clover .....227..J 10
Cloverdale .....I 8
Cluster Springs ...K 10
Cobbs Creek .....E 4
Coeburn ....2,362..J 3
Cohasset .....H 11
Coleman Falls .....I 9
Coles Point .....G 14
Collinsville ..6,015..J 8
Cologne .....E 3
Colonial Beach ....2,058..C 4
Colonial Heights ..15,097†.F 1
Columbia .....125..H 11
Columbia Furnace ..E 10
Concord .....I 9
Conicville .....E 10
Copper Hill .....J 7
Copper Valley .....J 7
Corbin .....G 12
Courtland ....899.°J 13
Covesville .....H 10
Covington ..10,060†°H 8
Craddockville .....H 15
Craig Springs .....I 7
Craigsville ....988..G 9
Crewe .....1,797..I 11
Criglersville .....C 1
Crimora .....G 10
Cripple Creek .....J 6
Crittenden .....G 4
Critz .....K 7
Crockett .....J 5
Cross Junction .....D 11
Crouch .....H 13
Crozet .....1,433..G 10
Crozier .....H 12
Crystal Hill .....J 10
Cullen .....I 10
Culpeper ....6,056.°C 1
Cumberland .....°I 11
Dabneys .....H 12
Dahlgren .....C 4
Dale City* .13,857..F 12
Daleville .....I 8
Damascus ...1,230..J 4
Danieltown .....J 11
Dante .....1,153..J 3
Danville ...46,391†.K 9
Davenport .....I 4
Dayton .....978..F 10
Deerfield .....G 9
Delaplane .....A 2
Deltaville .....E 4
Dendron .....336..F 2
De Witt .....F 1
Diggs .....E 4
Dillwyn .....497..H 10
Dinwiddie .....°I 12
Disputanta .....F 2
Doe Hill .....F 9
Dogue .....C 3
Dolphin .....J 12
Doran .....I 4
Doswell .....H 12
Dragonville .....H 14
Drakes Branch 702..J 10
Draper .....276..J 6
Drewryville .....H 1
Driver .....G 4
Dry Fork .....J 9
Dryden .....J 2
Dublin .....1,653..I 5
Duffield .....63..J 2
Dugspur .....J 6
Dumfries ...1,890..B 3
Dundas .....J 11
Dungannon ...282..J 3
Dunn Loring .....A 3
Dunnsville .....H 13
Dutton .....E 4
Dyke .....G 10
Eagle Rock .....H 8
Earlysville .....G 10
East Stone Gap ....J 3
Eastville .....203.°E 5
Ebony .....K 11
Eclipse .....G 4
Edgehill .....C 4
Edinburg .....766..E 10
Edwardsville .....G 14
Eggleston .....I 6
Elberon .....F 3
Elk Creek .....J 5
Elk Hill .....H 11
Elkton .....1,511..F 10
Elkwood .....B 2
Elliston .....I 7
Emmerton .....H 14
Emory .....J 4
Emporia ....5,300†°J 12
Epworth .....H 13
Esmont .....H 10
Etlan .....B 1
Ettrick .....F 1
Evergreen .....I 10
Evington .....I 9
Ewing .....J 1
Exeter .....J 2
Exmore .....1,421..H 15
Faber .....H 10
Fair Port .....H 14
Fairfax ....22,009†°A 3
Fairfield .....H 9
Fairlawn ...1,767..I 7
Falls Church ..10,772†.A 4
Falls Mills .....I 5
Falmouth ...2,139..C 3
Farmville ...4,331.°I 11
Farnham .....H 14
Fernicliff .....G 11
Ferrum .....J 8
Fieldale ....1,337..J 8
Fife .....H 11
Fincastle ....397.°I 8
Fishers Hill .....E 11
Fishersville .....G 10
Flint Hill .....B 1
Floyd .....474.°J 7
Foneswood .....G 13
Ford .....I 12
Forest .....I 9
Fork Union .....H 11
Forksville .....J 11
Fort Belvoir 14,591..B 4
Fort Blackmore ....J 3
Fort Hunt* 10,415..F 13
Fort Lee ..12,435..F 1
Fort Mitchell .....J 10
Foxwells .....D 4
Franconia .....B 4
Franklin ....6,880†.H 2
Fredericks Hall ....G 12
Fredericksburg .....14,450†.G 12
Free Union .....G 10
Freeman .....J 12
Fries .....885..J 5
Front Royal 8,211.°E 11
Fulks Run .....F 10
Gainesboro .....D 11
Gainesville .....A 2
Galax .....6,278†.J 6
Garrisonville .....C 3
Gasburg .....K 12
Gate City ....1,914.°J 3
Glade Spring 1,615..J 4
Gladehill .....J 8
Gladstone .....H 10
Gladys .....I 9
Glasgow ....1,304..H 9
Glen Allen .....D 1
Glen Lyn .....191..I 6
Glen Wilton .....H 8
Glenmore .....H 10
Glenwood ...1,295..K 9
Gloucester .....°I 14
Gloucester Point ...F 4
Goby .....C 3
Golansville .....G 12
Goldvein .....C 2
Goochland .....°H 11
Goode .....I 9
Gordonsville .1,253..G 11
Goshen .....121..G 8
Grafton .....F 4
Grant .....J 5
Graves Mill .....F 11
Gray .....G 1
Green Bay .....I 11
Greenville .....G 9
Gretna .....986..J 9
Groseclose .....J 5
Grottoes ...1,166..G 10
Groveton* ..11,761..E 13
Grundy .....2,054.°I 4
Gum Spring .....H 11
Gwynn .....E 4
Hadensville .....H 11
Hague .....G 14
Halifax .....899.°J 10
Hallieford .....E 4
Hallwood .....254..G 16
Hamilton .....502..E 12
Hampden Sydney ...I 10
Hampton ..120,779†.F 4
Handsom .....H 2
Hanover .....°H 12
Harborton .....H 15
Hardy .....I 8
Hardyville .....E 4
Harrisonburg .....14,605†°F 10
Hartfield .....E 4
Hartwood .....C 2
Hayfield .....D 11
Haymarket ...288..A 2
Haynesville .....G 14
Haysi .....428..I 3
Haywood .....C 1
Head Waters .....G 9
Healing Springs ....G 8
Heards .....H 10
Heathsville .....°G 14
Henry .....J 8
Herndon ....4,301..A 3
Highland Springs ...7,345..E 1
Hightown .....F 8
Hillsboro .....135..E 12
Hillsville ...1,149.°J 6
Hiltons .....J 3
Hiwassee .....J 6
Hobson .....G 4
Holland .....400..H 3
Hollins .....I 8
Holston .....J 4
Honaker .....911..J 4
Hopewell ...23,471†.F 1
Hopkins .....H 16
Horntown .....G 16
Horsepen .....I 5
Hot Springs .....G 8
Howertons .....H 13
Huddleston .....I 8
Hume .....A 1
Huntington* 5,559..E 13
Huntly .....A 1

Hurley .....I 4
Hurt .....1,434..I 9
Hustle .....G 13
Hybla Valley ...B 4
Independence .673.°K 5
Index .....G 13
Indian Neck .....H 13
Indian Valley ...J 7
Ingram .....J 9
Inman .....J 2
Iron Gate .....692..H 8
Irvington .....504..D 4
Isle of Wight .....°G 3
Ivanhoe .....J 6
Ivor .....444..G 3
Jamaica .....H 14
Jamestown .....F 3
Jamesville .....E 5
Jarratt .....591..G 1
Java .....J 9
Jefferson ...25,432..H 11
Jeffersonton .....B 2
Jericho* .....2,438..J 14
Jetersville .....I 11
Jewell Ridge .....I 4
Jewell Valley .....I 4
Jonesville .....700.°J 2
Jordan Mines .....H 7
Keeling .....J 9
Keen Mountain ....I 4
Keene .....H 10
Keller .....235..H 15
Kenbridge ..1,223..J 11
Kents Store .....H 11
Keokee .....J 2
Keswick .....G 11
Keysville .....818..J 10
Kilmarnock ...841..H 14
Kimballton .....I 6
King and Queen
Court House ....°D 3
King George .....°C 4
King William .....°H 13
Kinsale .....G 14
Lacey Spring .....F 10
La Crosse .....674..J 11
Ladysmith .....G 12
Lafayette .....I 7
Lake
Barcroft* 11,605..E 13
Lakeside ..11,137..D 1
Lambsburg .....K 6
Lancaster .....°H 14
Lanesville .....D 2
Laneview .....H 14
Laurel Fork .....J 7
Lawrenceville 1,636.°J 12
Lebanon ....2,272.°J 4
Lebanon Church ...E 11
Leesburg ....4,821.°E 12
Lennig .....J 10
Leon .....C 1
Lewis Gardens .....E 1
Lewisetta .....G 14
Lexington ..7,597†°H 9
Lightfoot .....E 3
Lignum .....C 2
Lincolnia* .10,761..E 13
Lincolnia Heights ..A 4
Linden .....A 1
Linville .....F 10
Lithia .....I 8
Little Plymouth ....D 3
Littleton .....G 2
Lively .....H 14
Lloyd Place* 2,367..J 14
Locust Hill .....E 4
Locust Grove .....C 2
Locustville .....H 16
Long
Branch* .21,634..E 13
Long Island .....J 9
Loretto .....G 13
Lorton .....B 3
Lottsburg .....G 14
Louisa .....633.°G 11
Lovettsville ...185..D 12
Lovingston .....°H 10
Lowmoor .....H 8
Lowry .....I 9
Lunenburg .....°J 11
Luray .....3,612.°F 10
Lyman Park-
Thomason
Park* ....3,765..F 12
Lynch Station .....I 9
Lynchburg .54,083†.I 9
Lyndhurst .....G 10
Machipongo .....E 5
Macon .....H 11
Madison .....299.°C 1
Madison Heights ...I 9
Madison Mills .....C 1
Manakin .....H 12
Manassas ...9,164.°B 3
Manassas
Park .....6,844..B 3
Mangohick .....H 13
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†Independent city, not part of any county.
*Does not appear on the map; key shows general location.
°County seat.

Source: Latest census figures (1970 and special census). Places without population figures are unincorporated areas and do not appear on census reports.

VIRGINIA / *People*

The 1970 United States census reported that Virginia had 4,648,494 persons. The state's population had increased 17 per cent over the 1960 census figure of 3,966,949. The U.S. Bureau of the Census estimated that by 1975 the population had reached 4,936,000.

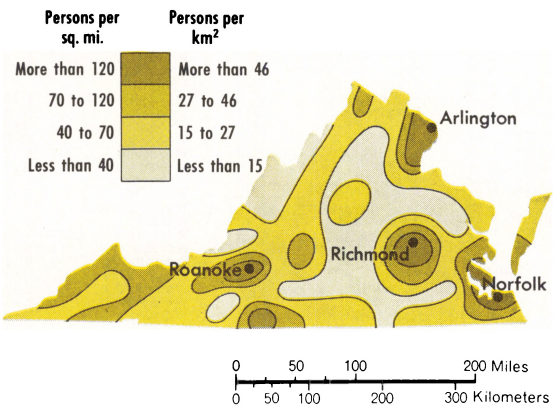
Over two-fifths of Virginia's people live in the metropolitan areas of Lynchburg, Newport News-Hampton, Norfolk-Virginia Beach-Portsmouth, Petersburg-Colonial Heights-Hopewell, Richmond, and Roanoke. Several Virginia cities and counties form part of the Washington, D.C. metropolitan area. The Kingsport (Tenn.)-Bristol (Va.) metropolitan area extends into Scott and Washington counties in Virginia. All these areas are Standard Metropolitan Statistical Areas (see METROPOLITAN AREA). For their populations, see the *Index* to the political map of Virginia. See also the separate articles on the cities of Virginia listed in the *Related Articles* at the end of this article.

Almost all Virginians were born in the United States. Many are of English, German, or Scotch-Irish ancestry. About 19 per cent of the people are Negroes.

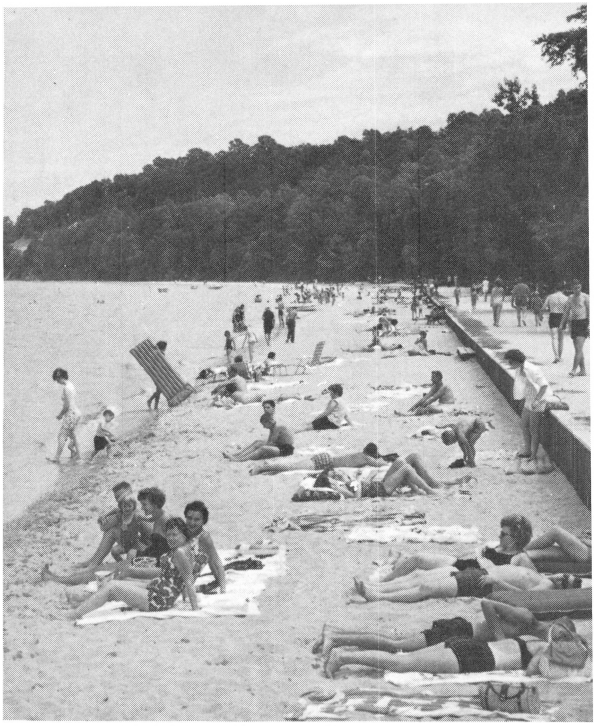
Southern Baptists and Methodists make up the largest religious groups in Virginia. Other religious groups, in order of size, include Presbyterians, Roman Catholics, and Episcopalians.

POPULATION

This map shows the *population density* of Virginia, and how it varies in different parts of the state. Population density means the average number of persons who live in a given area.



WORLD BOOK map



Virginia Dept. of Conservation and Economic Development

Sunbathers Relax on the sandy beaches of the Potomac River in Westmoreland State Park. Residents of Richmond and of the Washington, D.C., area often spend summer weekends in the park.

Virginia Dept. of Conservation and Economic Development

Social Life in small Virginia towns often centers around informal luncheons. Townspeople also meet at club picnics and church socials. These businessmen in Exmore are discussing their town's commercial affairs.

Schools. The Syms Free School was founded in Hampton in 1634, and the Eaton Free School began there about 1640. These were the first free schools in what is now the United States. Some Virginia planters and merchants established private schools called *old-field schools*. They built these schools in open fields. Beginning in the mid-1700's, many *academies* were founded. They were combined elementary and high schools. In 1810, the General Assembly created a Literary Fund to help poor children receive an education.

Virginia's statewide public-school system began in 1870. Like most other Southern states, Virginia had separate schools for Negroes and whites. State law required children between the ages of 7 and 16 to attend school. In 1954, the Supreme Court of the United States ruled that racial segregation in public schools is unconstitutional. Five years later, in 1959, some Virginia schools began to desegregate. The state's school attendance law was repealed in 1959. That same year, Prince Edward County closed its public schools to avoid integration. The county reopened the schools in 1964. Virginia re-adopted its school attendance law in 1968.

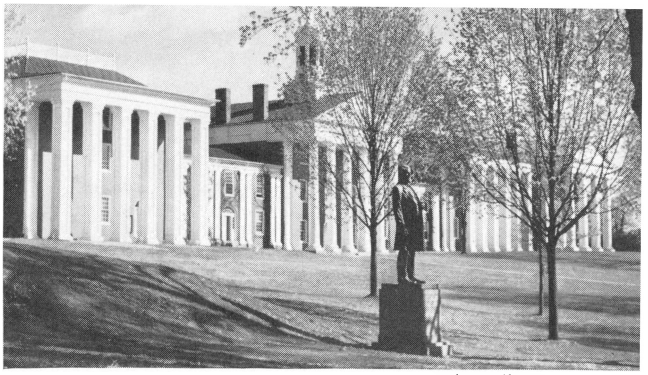
A nine-member board of education administers Virginia's school system. The governor appoints a superintendent of public instruction to serve during the governor's term of office. For the number of students and teachers in Virginia, see EDUCATION (table).

The College of William and Mary, founded in Williamsburg in 1693, is the second oldest institution of higher learning in the United States. Harvard University is the oldest. Phi Beta Kappa, the honorary scholastic society, was founded at William and Mary in 1776 (see PHI BETA KAPPA).

Libraries and Museums. Virginia's first public library was established in Alexandria in 1794. Today, the state has more than 85 public libraries and 48 bookmobiles. The State Library in Richmond, founded in 1828, is the largest library in Virginia that is not connected with a college or university.

The White House of the Confederacy, now known also as The Museum of the Confederacy, was Jefferson Davis' Richmond home. It has more than 16,000 Civil War relics, including the original provisional constitution of the Confederacy. The Virginia Historical Society in Richmond has pictures of Civil War battles and southern heroes.

The Virginia Museum of Fine Arts in Richmond is the oldest state-supported art museum in the United States. The Valentine Museum, also in Richmond, has exhibits on Richmond and Virginia history. The Mariners Museum in Newport News displays models and paintings of ships, and other items that show the development of shipping. The Edgar Allan Poe Museum in Richmond has exhibits connected with the poet's years in that city.



Ewing Galloway

Washington and Lee University was named for George Washington and Robert E. Lee. It was founded in 1782.

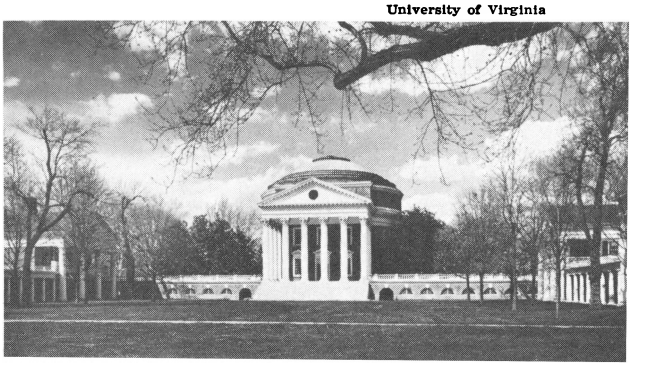
UNIVERSITIES AND COLLEGES

Virginia has 35 universities and colleges accredited by the Southern Association of Colleges and Schools. For enrollments and further information, see UNIVERSITIES AND COLLEGES (table).

Name	Location	Founded
Averett College	Danville	1971
Bridgewater College	Bridgewater	1880
Eastern Mennonite College	Harrisonburg	1917
Emory and Henry College	Emory	1836
George Mason University	Fairfax	1965
Hampden-Sydney College	Hampden-Sydney	1776
Hampton Institute	Hampton	1868
Hollins College	Roanoke	1842
Longwood College	Farmville	1884
Lynchburg College	Lynchburg	1903
Madison College	Harrisonburg	1908
Mary Baldwin College	Staunton	1842
Mary Washington College	Fredericksburg	1919
Norfolk State College	Norfolk	1956
Old Dominion University	Norfolk	1930
Presbyterian School of Christian Education	Richmond	1914
Radford College	Radford	1910
Randolph-Macon College	Ashland	1830
Randolph-Macon Woman's College	Lynchburg	1891
Richmond, University of	Richmond	1830
Roanoke College	Salem	1842
Shenandoah College and Conservatory of Music	Winchester	1937
St. Paul's College	Lawrenceville	1888
Sweet Briar College	Sweet Briar	1901
Union Theological Seminary	Richmond	1971
Virginia, University of	*	*
Virginia Commonwealth University	Richmond	1838
Virginia Intermont College	Bristol	1972
Virginia Military Institute	Lexington	1839
Virginia Polytechnic Institute and State University	Blacksburg	1872
Virginia State College	Petersburg	1882
Virginia Union University	Richmond	1899
Virginia Wesleyan College	Norfolk	1970
Washington and Lee University	Lexington	1782
William and Mary, College of	*	*

*For campuses and founding dates, see UNIVERSITIES AND COLLEGES (table).

University of Virginia



University of Virginia in Charlottesville was founded in 1819 through the efforts of Thomas Jefferson. The school held its first classes in 1825. Jefferson became the institution's first rector, and held this position until his death in 1826. He designed the Rotunda, which was modeled after the Pantheon in Rome.

Arthur Griffin, FPG

Boys' Fife and Drum Corps Parade in Williamsburg

VIRGINIA / *A Visitor's Guide*

Virginia is known for its stately old homes and other historic sites. The most popular homes include George Washington's Mount Vernon near Alexandria, and Thomas Jefferson's Monticello near Charlottesville. Williamsburg, the second colonial capital, has been restored to look as it did in colonial days. See MONTICELLO; MOUNT VERNON; WILLIAMSBURG.

Many visitors drive along the crest of the Blue Ridge. They travel on the Skyline Drive in the north, and on the Blue Ridge Parkway in the south. In spring, azaleas, dogwoods, and laurels bloom on the mountain slopes. In autumn, the leaves of hardwood trees and shrubs turn bright red, orange, and yellow.

The Atlantic Ocean, Chesapeake Bay, and tidal rivers offer beach sports, fishing, and sailing. Virginia Beach, southeast of Norfolk, is an especially popular ocean resort. Hunters seek game in Dismal Swamp and in the forested highlands.

PLACES TO VISIT

Following are brief descriptions of some of Virginia's many interesting places to visit.

Caverns are common in western Virginia. Many of them feature colorful limestone formations.

Churches. *Bruton Parish Church* (built from 1710 to 1715) in Williamsburg is one of the nation's oldest Episcopal churches. George Washington and Robert E. Lee worshiped at *Christ Church* (1767-1773) in Alexandria. The Second Virginia Convention met in 1775 at *St. John's Church* (1741) in Richmond. There, Patrick Henry gave his famous call for liberty or death. *St. Luke's Church* (1632) near Smithfield is thought to be the oldest brick church in the original 13 states that is still standing. *St. Paul's Church* (1739) in Norfolk was the only building left after Virginia troops burned the town in 1776. Robert E. Lee and Jefferson Davis worshiped in Richmond's *St. Paul's Episcopal Church* (1844), the "Church of the Confederacy."

Homes. *Berkeley* (1726), near Richmond, was the birthplace of President William Henry Harrison. *Carter's Grove* (1751) is among the most beautiful of the old plantations along the James River. *Gunston Hall* (1755), near Lorton, was the home of George Mason, the author of the Virginia Bill of Rights. The *John Marshall House* (about 1790) in Richmond was long the home of the great Chief Justice of the United States. *Stratford Hall* (about 1730), near Montross, was the birthplace of Robert E. Lee.

Jamestown Festival Park, on the James River, has reproductions of old James Fort and of the three ships that brought the first settlers to Jamestown in 1607.

Lion Country Safari, near Richmond, is an animal preserve where lions and other wild animals roam free. Visitors may drive through the area in cars.

Natural Bridge is a famous landmark south of Lexington. Water carved away softer rock and left the hard rock that forms the bridge.

Natural Chimneys are seven rock towers. They rise over 100 feet (30 meters) near Mount Solon.

Natural Tunnel, near Gate City, is a giant passageway cut through the Purcell Ridge by the waters of Stock Creek. A railroad runs through the tunnel.

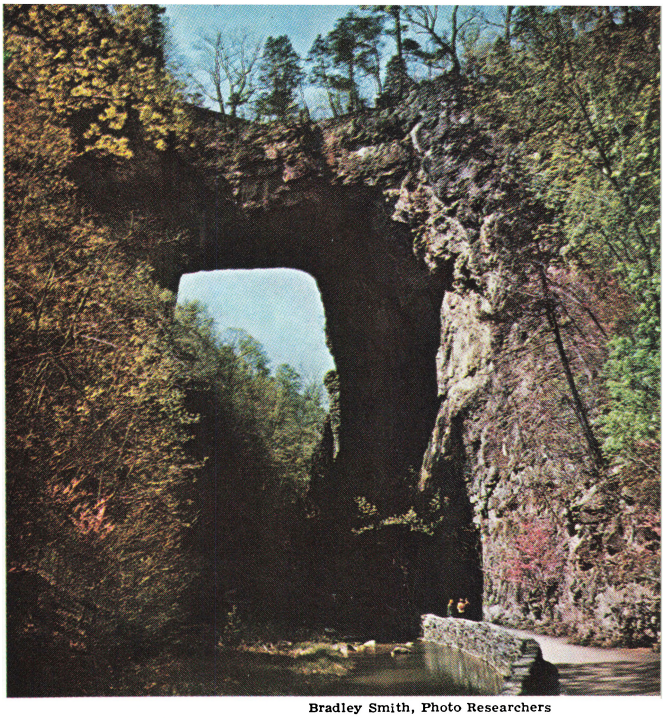
National Parks, Monuments, and Forests. The National Park Service administers many areas in Virginia. Shenandoah National Park in the Blue Ridge, George Washington Birthplace National Monument in Westmoreland County, and Booker T. Washington National Monument near Roanoke are described under their own names in WORLD BOOK. Virginia has three national historical parks: (1) Appomattox Court House, which includes McLean House, site of the agreement on the terms of surrender in the Civil War; (2) Colonial, which includes Yorktown and most of Jamestown Island; and (3) Cumberland Gap, which extends into Kentucky and Tennessee. See NATIONAL PARK SYSTEM (table).

Manassas National Battlefield Park is the site of the Battles of Manassas, or Bull Run. Other historic sites include Richmond National Battlefield Park; Petersburg National Battlefield; and the Fredericksburg and Spotsylvania County Battlefields Memorial.

Most of George Washington National Forest lies in

Robert H. Glaze, Artstreet

Carter's Grove Plantation near Williamsburg



Bradley Smith, Photo Researchers

Natural Bridge near Lexington

northwestern Virginia. It also extends into West Virginia. Jefferson National Forest lies in southwestern Virginia. The forest also extends into West Virginia and Kentucky. For the areas and chief features of George Washington National Forest and Jefferson National Forest, see NATIONAL FOREST (table).

State Forests and Parks. Virginia has 6 state forests, 14 state parks, an interstate park, and several other historical, natural, and recreational areas. For information on Virginia's state parks, write to Commissioner, Division of Parks, Department of Conservation and Economic Development, Old State Office Building, Richmond, Va. 23219.

ANNUAL EVENTS

Many of Virginia's most beautiful homes and gardens are open to the public during Historic Garden Week. This event takes place late in April.

Another popular event is Pony Penning on Chincoteague Island, held on the last Wednesday and Thursday in July. The ponies live on nearby Assateague Island. But at Pony Penning time they are driven across the shallow channel to Chincoteague, where some of them are sold.

Other annual events in Virginia include the following.

January-May: Antiques Forum in Williamsburg (late in January); Garden Symposium in Williamsburg (mid-March); International Azalea Festival in Norfolk (late in April); Dogwood Festival in Charlottesville (late in April); Shenandoah Apple Blossom Festival in Winchester (late in April).

June-December: East Coast Surfing Championship at Virginia Beach (June); Boardwalk Art Show in Virginia Beach (mid-July); Highlands Arts and Crafts Festival in Abingdon (first two weeks in August); Shenandoah Valley Music Festival in Woodstock (August); Old Fiddlers' Convention in Galax (August); Jousting Tournament at Natural Chimneys near Mount Solon (August); State Fair in Richmond (September); National Tobacco Festival in Richmond (first two weeks in October).

Ellis-Sawyer, Alpha

Models of Sailing Ships in Jamestown Festival Park

McLean House near Appomattox

Jack Zehrt, FPG

Specially created for **World Book Encyclopedia** by Rand McNally and World Book editors

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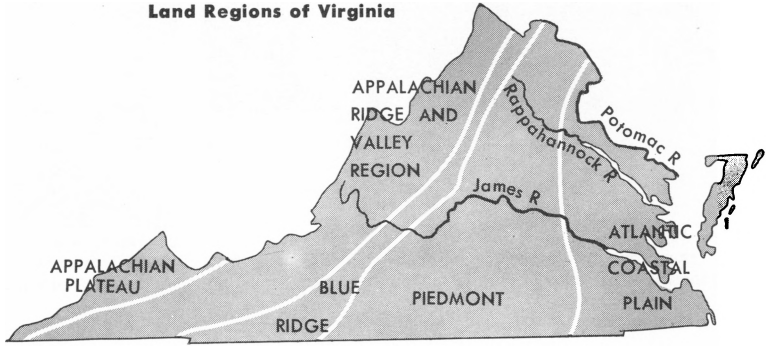
Allegheny Mts. .....C 4
Appalachian Mts. ...C 3
Appomattox R. .....C 6
Appomattox Court House Nat'l. Hist. Park .....C 6
Bald Knob (Mountain) .....C 5
Big Stone Ridge ...C 2
Blue Ridge Mts. ....D 4
Bull Run Mts. .....B 7
Cape Henry .....D 9
Catoctin Mountain ..A 7
Chesapeake Bay .....B 8
Clark Mountain .....B 7
Claytor Lake .....C 4
Clinch R. .....D 2
Coastal Plain .....D 7
Colonial Nat'l. Hist. Park .....C 8
Cowpasture R. .....B 5
Cumberland Gap Nat'l. Hist. Park ..D 1
Dismal Swamp .....D 8
False Cape .....D 9
George Washington Birthplace Nat'l. Monument .....B 8
Great Valley .....C 4
High Knob (Mountain) .....A 6
Holston R. .....D 2
Hyco Lake .....D 6
Iron Mts. .....D 3
Jack Mountain .....B 5
Jackson R. .....C 5
James R. .....C 7
John W. Flannagan Flood Control Reservoir .....C 2
Kerr Reservoir .....D 6
Lake Gaston .....D 7
Leesville Lake .....C 5
Mattaponi R. .....C 7
Meherrin R. .....D 7
Mt. Rogers .....D 3
New Point Comfort (Pt.) .....C 8
New R. .....D 4
North Mountain ....B 6
Nottoway R. .....D 7
Pamunkey R. .....C 7
Peters Mountain ....C 4
Philpott Lake .....D 4
Piedmont Plateau ...D 5
Potomac R. .....B 8
Rappahannock R. ...B 7
Rich Mountain .....C 3
Roanoke (Stauton) R. C 5
Shenandoah Mountain .....B 5
Shenandoah Nat'l. Park .....B 6
Shenandoah R. .....B 6
North Fork .....B 6
Shenandoah Valley .....B 6
Smith Isl. .....C 8
Smith Mountain Lake C 5
Smith Pt. .....C 8
South Holston Lake .D 2
Tangier Isl. .....C 8
Walker Mountain ...D 3
York R. .....C 8

Virginia Dept. of Conservation and Economic Development

Pinnacle Overlook provides a breath-taking view of Cumberland Gap National Historic Park in southwestern Virginia. From this spot, visitors can see parts of Kentucky and Tennessee.

Land Regions of Virginia



VIRGINIA / *The Land*

Land Regions. Virginia has five main land regions: (1) the Appalachian Plateau, (2) the Appalachian Ridge and Valley Region, (3) the Blue Ridge, (4) the Piedmont, and (5) the Atlantic Coastal Plain.

The Appalachian Plateau is a rugged region in the southwestern part of the state. It has an average elevation of 2,000 feet (610 meters). Many streams flow westward through the region. In some places, they have cut deep gorges. The plateau is covered with forests and has valuable coal fields.

The Appalachian Ridge and Valley Region consists of a series of parallel mountain ridges that extend northeast and southwest along most of the state's western border. The Great Valley, or Valley of Virginia, lies in the eastern part of this region. The Great Valley is actually a series of separate river valleys. The largest of these is the Shenandoah Valley in the north. A prominent mountain ridge, the Massanutten, divides the Shenandoah Valley into two parts for much of its length. The Appalachian Ridge and Valley Region has many caves and other rock formations created by the action of water on limestone.

The Blue Ridge borders the Appalachian Ridge and Valley Region on the east. It is the main eastern range of the Appalachian Mountain System, and an outstanding feature of Virginia. Northeast of Roanoke, the ridge is narrow and rises sharply from the lower land east and west of it. South of Roanoke, the Blue Ridge broadens into a plateau with mountain peaks, valleys, and deep ravines. The highest peaks in Virginia—Mount Rogers (5,729 feet, or 1,746 meters) and Whitetop Mountain (5,520 feet, or 1,682 meters)—are in the southern part of the Blue Ridge.

The Piedmont, in central Virginia, is the state's largest land region. It is an elevated, gently rolling plain, about 40 miles (64 kilometers) wide in the northeast and widening to about 140 miles (225 kilometers) at the North Carolina border. The Piedmont has an average elevation of 800 to 900 feet (240 to 270 meters) in the west. It slopes gradually to an average elevation of 200 to 300 feet (61 to 91 meters) in the east. Many rivers and streams flow southeastward across the Piedmont. They break into low waterfalls at the eastern edge of the region, known as the *fall line* (see FALL LINE).

The Atlantic Coastal Plain is a lowland region about

FPG

Shenandoah Valley is a beautiful rolling area in the Appalachian Ridge and Valley Region of northwest Virginia. Many springs and caverns are scattered through the valley.

100 miles (160 kilometers) wide that extends north and south along the Atlantic Ocean. It is sometimes called the *Tidewater*, because tidal water flows up its bays, inlets, and rivers. Chesapeake Bay divides the region into a western mainland section and a large peninsula called the *Eastern Shore*. The region has many salt marshes and swamps. The largest of these is Dismal Swamp, in the southeast.

Coastline. Virginia has a general coastline of 112 miles (180 kilometers). The *tidal shoreline* (including small bays and inlets) is 3,315 miles (5,335 kilometers). Sand bars and islands along the coast have created several lagoons. A long, sandy beach stretches southward from the Norfolk area.

Rivers and Lakes. Several rivers flow from the western mountains and the Piedmont into Chesapeake Bay. These rivers include the Rappahannock, James, and York. They divide the Tidewater area into a series of peninsulas. The Potomac River forms Virginia's northeastern border. It is an important transportation route between Alexandria and Chesapeake Bay. The Shenandoah River flows northward through the Great Valley and empties into the Potomac.

The Roanoke River flows southeastward across the Piedmont into North Carolina. The New River begins in North Carolina and flows north and west through southwestern Virginia into West Virginia. Several rivers in the southwestern corner of the state, including the Clinch, Holston, and Powell, flow southwestward toward the Tennessee Valley.

Virginia's largest natural lake is Lake Drummond (3,200 acres, or 1,290 hectares) in Dismal Swamp. Many artificial lakes have been formed by damming rivers for hydroelectric power, recreation, or other purposes. The largest of these man-made lakes is Kerr Reservoir on the North Carolina border. About 36,140 acres (14,625 hectares) of this lake are in Virginia.

Gently Rolling Farmland surrounds the town of Appomattox in the Piedmont, the largest land region in Virginia.

Herbert Lanks, FPG

Wild Flowers add brilliant splashes of color to the famous Blue Ridge Mountains of Virginia in Shenandoah National Park.

W. Hampshire, FPG

FPG

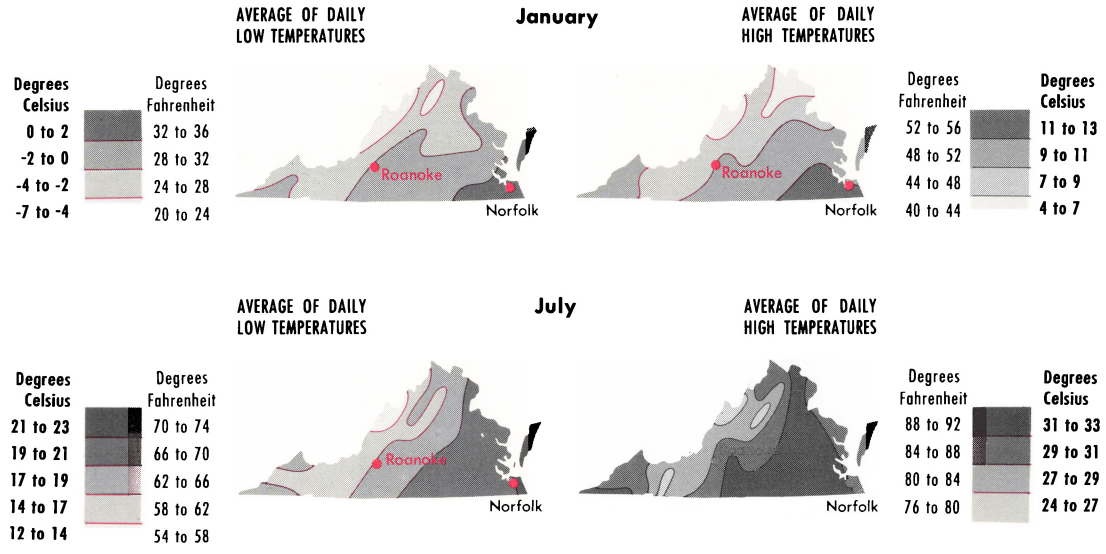
Cool Sea Breezes refresh bathers at Virginia Beach. This popular resort area lies on the Atlantic Coastal Plain.

VIRGINIA / *Climate*

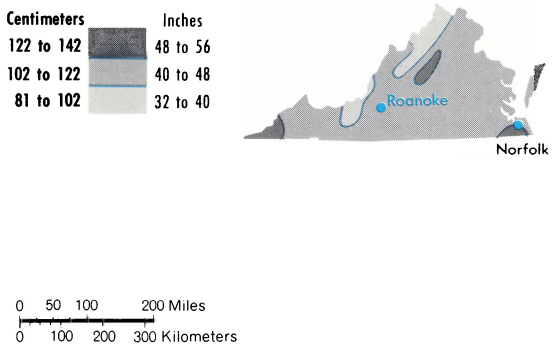
The climate of Virginia is mild. Temperatures vary from east to west as the elevation of the land and the distance from the ocean increase. In January, temperatures average 41° F. (5° C) in the Tidewater area, and about 32° F. (0° C) in parts of the Blue Ridge. July temperatures average 78° F. (26° C) in the Tidewater and about 68° F. (20° C) in the mountains. The state's highest temperature, 110° F. (43° C), occurred at Columbia on July 5, 1900, and at Balcony Falls on July 15, 1954. The record low, −29° F. (−34° C), occurred at Monterey on Feb. 10, 1899.

Virginia's *precipitation* (rain, melted snow, and other forms of moisture) is lightest in the Shenandoah Valley, where it averages about 36 inches (91 centimeters) a year. In the south, it averages about 44 inches (112 centimeters). Snowfall ranges from 5 to 10 inches (13 to 25 centimeters) in the Tidewater to 25 to 30 inches (64 to 76 centimeters) in the western mountains.

SEASONAL TEMPERATURES



AVERAGE YEARLY PRECIPITATION
(Rain, Melted Snow, and Other Moisture)



WORLD BOOK maps

AVERAGE MONTHLY WEATHER

NORFOLK	Temperatures F° High	Temperatures F° Low	Temperatures C° High	Temperatures C° Low	Days of Rain or Snow
JAN.	50	33	10	1	11
FEB.	51	33	11	1	11
MAR.	59	39	15	4	12
APR.	66	46	19	8	10
MAY	75	56	24	13	11
JUNE	84	65	29	18	11
JULY	86	69	30	21	12
AUG.	85	68	29	20	12
SEPT.	80	64	27	18	8
OCT.	70	52	21	11	8
NOV.	60	43	16	6	8
DEC.	57	34	14	1	10

ROANOKE	Temperatures F° High	Temperatures F° Low	Temperatures C° High	Temperatures C° Low	Days of Rain or Snow
JAN.	47	29	8	-2	11
FEB.	49	30	9	-1	11
MAR.	57	36	14	2	12
APR.	67	44	19	7	10
MAY	77	53	25	12	11
JUNE	84	61	29	16	11
JULY	87	65	31	18	11
AUG.	85	64	29	18	11
SEPT.	80	58	27	14	11
OCT.	70	46	21	8	8
NOV.	57	37	14	3	10
DEC.	48	30	9	-1	9

VIRGINIA / Economy

Throughout most of its history, Virginia had an agricultural economy based on tobacco and other plantation crops. Manufacturing industries grew rapidly after about 1940. Today, the economy is based largely on manufacturing and federal government activities. Virginia's location near highly populated areas of the northeast and the rapidly growing states in the southeast is favorable for industry. Deposits of coal and other natural resources, good transportation by land and water, and a growing population also favor industry.

The tourist industry greatly aids the Virginia economy. About 45 million persons visit the state yearly and spend about $1 billion. Virginia also benefits from the Norfolk Naval Base and from other U.S. government installations in the state. About 363,000 persons who live in Virginia are members of the U.S. armed forces or are civilian employees of the federal government. Most of them live in the Hampton Roads area or in counties and cities near Washington, D.C.

Natural Resources of Virginia include varied soils, many mineral deposits, valuable forest land, and much marine life, especially in Chesapeake Bay.

Soil. Most of the western, mountainous part of Virginia has shallow, rocky soils. The valley soils are stony and not very fertile, except in parts of the Shenandoah Valley and other areas where the soil contains much lime. Soils are stony and shallow in the northern part of the Blue Ridge, but deeper and darker in the southwest. Piedmont soils are generally light in color and have a loamy texture. Most soils in the Atlantic Coastal Plain are sandier than those in other parts of Virginia. The sandy soils are generally deep and easily cultivated.

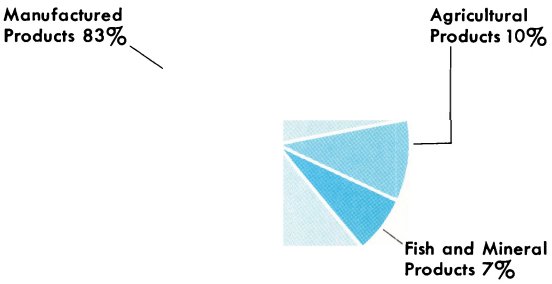
Minerals. Coal is Virginia's most important mineral resource. Most of the coal is in the southwestern part of the state. Virginia's coal reserves are estimated at about 10 billion short tons (9 billion metric tons). *Bituminous* (soft) coal makes up most of these reserves. The famous Pocahontas coal of Buchanan and Tazewell counties is among the bituminous deposits. Virginia has deposits of *semianthracite* (fairly hard coal) in Montgomery and Pulaski counties.

Virginia stones include basalt, granite, limestone, marble, sandstone, shale, and soapstone. Most of the limestone is found in the Appalachian Ridge and Valley Region. The Atlantic Coastal Plain has large deposits of clay, and sand and gravel. Lead and zinc ores occur in Wythe County. Some manganese minerals occur in the Appalachian Ridge and Valley Region, the Blue Ridge Mountains, and the Piedmont. Other minerals include feldspar, gem stones, gypsum, kyanite, mica, natural gas, petroleum, pyrite, salt, and titanium.

Plant Life. Commercially valuable forests cover about 60 per cent of Virginia's land area. These forests consist mainly of second- and third-growth trees. Hardwoods are the most common trees in the western part of the

PRODUCTION OF GOODS IN VIRGINIA

Total value of goods produced in 1971—$6,216,298,000



Percentages are based on farm income, value added by manufacture, and value of fish and mineral production. Fish products are less than 1 per cent.
Sources: U.S. government publications, 1971-1973.

EMPLOYMENT IN VIRGINIA

Total number of persons employed in 1972—1,648,400

	Number of Employees
Manufacturing	383,300
Wholesale & Retail Trade	325,200
Government	324,500
Community, Business, & Personal Services	238,400
Construction	105,800
Transportation & Public Utilities	100,400
Agriculture	79,000
Finance, Insurance, & Real Estate	75,800
Mining	16,000

Sources: *Employment and Earnings*, May, 1973, U.S. Bureau of Labor Statistics; U.S. Bureau of Employment Security.

Firestone Synthetic Fibers Company

Polyester Yarns are wound onto huge beams in a Hopewell chemical plant, *left*, before being shipped to textile mills. Man-made fibers, such as polyesters and acrylics, rank as the chief chemical products manufactured in Virginia. The production of chemicals and related products is the leading industrial activity in the state.

The Largest U.S. Shipyard is in Newport News, Va. It has built more than 600 vessels, including the U.S.S. *Nimitz,* the largest nuclear-powered aircraft carrier in the world.

Newport News Shipbuilding

state. Oak is the most important hardwood for lumber production. Other hardwoods include ash, beech, birch, black tupelo, hickory, locust, maple, sweet gum, and tulip trees. Evergreen trees are most extensive in the east. Pines, including loblolly, eastern white, pitch, and shortleaf, have the greatest value. Other evergreens in Virginia include hemlock, red cedar, and spruce.

The flowering dogwood, the state flower, blooms throughout Virginia in early spring. Wild azaleas, mountain laurels, redbuds, rhododendrons, and other flowering plants grow in the mountain areas. Wild flowers in Virginia fields and forests include blue lobelias, lowland laurels, morning-glories, and violets.

Animal Life. Deer and some elk roam the wooded areas of Virginia. Black bears and wildcats live in the western mountains and in Dismal Swamp. Small animals include foxes, muskrats, opossums, rabbits, and raccoons. Virginia has many game birds, including ducks, geese, quails, ruffed grouse, and turkeys.

Fresh-water fishes include alewives, bass, carp, perch, pickerel, pike, and trout. Drum, flounder, mackerel, menhaden, and shad are found in the Atlantic Ocean, in Chesapeake Bay, and in the state's many inlets. Clams, crabs, oysters, and scallops also live in Chesapeake Bay and in shallow coastal waters.

Manufacturing accounts for about 83 per cent of the value of goods produced in Virginia. Goods manufactured there have a *value added by manufacture* of about $5 billion yearly. This figure represents the value created in products by Virginia industries, not counting such costs as materials, supplies, and fuels. Virginia's chief manufactured goods, in order of importance, are (1) chemicals and related products, (2) tobacco products, (3) processed foods, and (4) electrical equipment.

Chemical Products manufactured and processed in Virginia have a value added of about $778 million yearly. The leading chemical products are synthetic fibers, such as nylon. They are made in Front Royal, Hopewell, Martinsville, Narrows, Waynesboro, and Williamsburg, and in Chesterfield County. Elkton, Lynchburg, and Richmond have drug factories. The largest fertilizer plants are in Chesapeake, Danville, and Norfolk. Factories along Chesapeake Bay process fish meal and oil from menhaden, a kind of fish.

Tobacco Products have an annual value added of about $550 million. These products include mainly cigarettes and pipe tobacco. The largest factories are in Richmond and Petersburg. Virginia ranks second only to North Carolina in the number of workers employed in the tobacco industry.

Processed Foods account for about $510 million yearly in value added. Virginia factories produce bakery products, beverages, candy, canned and frozen foods, dairy products, and meat products. Factories along Chesapeake Bay process crabs and oysters. Winchester is the center of the apple products industry in the state. Some Virginia factories make feed for livestock and poultry.

Electrical Equipment has a value added of about $473 million yearly. Factories produce electronic components and radio and television equipment. Virginia's chief electrical equipment centers include Alexandria, Charlottesville, Salem, and Suffolk.

Other Important Industries produce, in order of value, transportation equipment, textiles, paper and related products, furniture and fixtures, clothing, fabricated metal products, lumber and wood products, and printed materials. Newport News Shipbuilding is the largest shipbuilding and ship-repairing yard in the nation. Portsmouth and Norfolk also have shipyards.

Agriculture. Virginia has a farm income of about $635 million a year. This figure is about 10 per cent of the value of all goods produced in the state. Virginia has about 65,000 farms, averaging about 165 acres (67 hectares) in size.

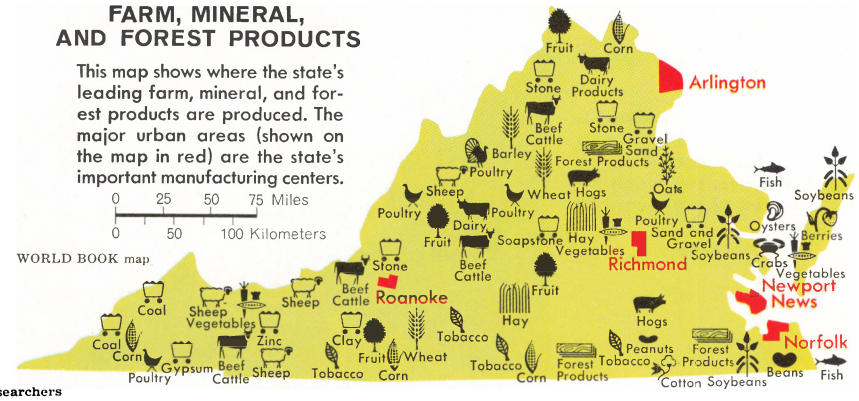
Livestock, dairying, and poultry raising provide more than half of Virginia's farm income. Farmers raise beef and dairy cattle in all parts of the state. They also raise hogs, horses, and sheep. The state is known for its Smithfield hams. Virginia is a leading producer of turkeys, and also raises large numbers of broiler chickens. Rockingham County is one of the leading counties in the United States in turkey production.

Virginia is a major tobacco-producing state. Farmers grow tobacco on only a small part of Virginia's cropland. But tobacco provides more farm income than any other crop. Most of it is grown in the Piedmont region south of the James River. Other field crops include corn, peanuts, and soybeans. Peanuts are grown in the southeast, especially in Southampton County. Winter wheat is raised mainly east of the Blue Ridge Mountains.

Most commercial production of vegetables takes

FARM, MINERAL, AND FOREST PRODUCTS

This map shows where the state's leading farm, mineral, and forest products are produced. The major urban areas (shown on the map in red) are the state's important manufacturing centers.



WORLD BOOK map

Millions of Apples cover the ground in Winchester in the Shenandoah Valley. Many apples are processed into juice, vinegar, or applesauce. Virginia ranks among the leading states in apple production.

Tom Hollyman, Photo Researchers

E. L. Korb, Alpha

A Worker Cuts Tobacco Leaves on a farm in the Piedmont region of southern Virginia. Farmers raise tobacco on only a small part of Virginia's land. But tobacco provides more farm income than any other crop grown in the state.

A Flock of White Turkeys gathers around the feeding trough on a farm in Rockingham County in northwestern Virginia. This county is one of the leading counties in the United States in the production of turkeys. Virginia is also known for its Smithfield hams.

Bradley Smith, Photo Researchers

place near Chesapeake Bay. Virginia's leading vegetable crops include potatoes, snap beans, sweet potatoes, and tomatoes. The state has large apple orchards. Over half the trees are in the Shenandoah Valley. Peaches, pears, and strawberries also are grown.

Mining accounts for about 6 per cent of the value of goods produced in Virginia, or about $385 million a year. Coal is the most important mining product. The state produces about 31 million short tons (28.1 million metric tons) of coal yearly. Large amounts of bituminous coal come from Buchanan, Dickenson, Russell, and Wise counties.

Stone production in Virginia totals about 35 million short tons (31.8 million metric tons) a year. Limestone from the western valleys is used in making cement and lime. Albemarle and Nelson counties have the largest soapstone quarries in the United States. Basalt, granite, marble, and sandstone are also quarried in the state. Sand and gravel production occurs primarily on the Atlantic Coastal Plain.

Lead and zinc ores are mined in Wythe County. Virginia also produces brick clay, feldspar, gem stones, gypsum, iron oxide pigments, kyanite, natural gas, petroleum, salt, and titanium ore.

Fishing Industry. Virginia ranks among the leading fishing states. Its yearly fish catch has a value of about $22 million. Virginia is a leading state in crab and oyster production. Other seafoods include alewives, clams, flounder, scallops, spot, and striped bass. Menhaden are processed into fertilizer and oil.

Electric Power. Most of Virginia's electric power comes from steam plants that burn coal or oil. The main steam plants are in Virginia and West Virginia. Major hydroelectric plants that supply power to Virginia operate at the Claytor, John H. Kerr, Leesville, and Smith Mountain dams in Virginia, and at the Gaston and Roanoke Rapids dams in North Carolina.

Transportation. The Little River Turnpike was the first U.S. toll road. It was built in the late 1780's from Alexandria to Snicker's Gap in the Blue Ridge. Today, almost all of Virginia's 60,000 miles (97,000 kilometers) of roads and highways are surfaced. Long bridges cross the Tidewater rivers. The Chesapeake Bay Bridge-Tunnel, 23 miles (37 kilometers) long, connects the mainland with the Eastern Shore.

The first Virginia railroad began operating in 1831. It carried coal on flatcars pulled by mules. The wooden track, 12 miles (19 kilometers) long, went from the mines of Chesterfield County to Richmond. Today, railroads operate on over 4,000 miles (6,400 kilometers) of track. About 20 rail lines provide freight service. Passenger trains serve about 15 Virginia cities.

About 150 airports serve Virginia. Dulles International Airport, one of the nation's largest, lies near Chantilly. Washington National Airport is near Alexandria. Several other cities also have major airports.

Large ships can travel on Chesapeake Bay and some distance up the James and Potomac rivers. Hampton Roads, at the junction of the James, Nansemond, and Elizabeth rivers, is an important harbor area. Norfolk, on Hampton Roads, is one of the leading ports in the United States. Other important ports include Newport News on Hampton Roads, Alexandria on the Potomac, and Hopewell and Richmond on the James. The Dismal Swamp Canal and the Albemarle and Chesapeake Canal form part of the Atlantic Intracoastal Waterway (see ATLANTIC INTRACOASTAL WATERWAY).

Communication. In 1736, William Parks, Virginia's public printer, founded the *Virginia Gazette*, the first newspaper in the colony. *The Alexandria Gazette* began in 1784 as a weekly, and became a daily in 1797. It is one of the oldest continuously published dailies in the United States. The *Richmond Times-Dispatch*, *The Richmond News Leader*, and *The Virginian-Pilot* of Norfolk are among the most widely read newspapers in the South.

Virginia's first commercial radio station, WTAR, began in Norfolk in 1923. The state's first television station, WTVR, started in Richmond in 1948. Virginia has about 185 radio stations and 17 TV stations.

VIRGINIA / *History*

Indian Days. When the first English colonists arrived in the Virginia region, Indian tribes of three major language groups lived there. The Powhatan, members of the Algonkian language group, lived in the coastal area. The Monacan and Manahoac, who spoke the Siouan language, occupied the Piedmont region. Other Siouan tribes in the Virginia region included the Nahyssan along the James River, and the Occaneechi on the Roanoke River. The Susquehanna near the upper Chesapeake Bay, the Cherokee in the southwest, and the Nottoway in the southeast spoke the Iroquoian language.

Early Settlement. The first Europeans who settled in Virginia were a group of Spanish Jesuits. In 1570, they established a mission, perhaps on the York River. Indians wiped out the settlement a few months later.

In 1584, Queen Elizabeth I of England gave the English adventurer Sir Walter Raleigh permission to establish colonies in America. Raleigh and others soon sent expeditions. These expeditions failed because they did not have enough supplies. Raleigh and the queen named what is now the eastern United States *Virginia*.

The Jamestown Settlement. In 1606, King James I chartered the Virginia Company of London (often called the London Company) for colonization purposes. In May, 1607, colonists sent by the company established the first permanent English settlement in America, at Jamestown. The colony, led by Captain John Smith, survived many hardships. In 1609, Smith was injured and had to return to England. The following winter, so many settlers died from lack of food that the period became known as the *starving time*. In the spring, the discouraged colonists started to leave Jamestown. But they returned after they met the ships of Governor Thomas West, Lord De La Warr, at Hampton Roads. The ships brought supplies and new colonists. After Lord De La Warr returned to England, Thomas Gates and Thomas Dale served as deputy governors.

Progress of the Colony. John Rolfe, one of the colonists, began to raise tobacco in 1612. Rolfe developed a method of curing tobacco. He proved that tobacco

could be successfully exported. Tobacco exporting helped save the colony by giving the people a way to support themselves. In 1614, Rolfe married Pocahontas, a daughter of Powhatan, chief of the Indian confederation around Jamestown. Their marriage brought a period of peace between the Indians and the colonists.

By 1619, each free colonist had been granted land of his own. That year, the Virginia Company made plans to send a boatload of young women to the colony to become wives of the lonely settlers. Also in 1619, Dutch traders brought Negroes to Virginia for the first time.

The first representative legislature in America, the House of Burgesses, was formed in 1619. Its first meeting was called by Governor George Yeardley, who acted on instructions from the Virginia Company. The House of Burgesses met with the governor and his council to make laws for the colony. This combined lawmaking body was called the General Assembly of Virginia.

Powhatan, the friendly Indian chief, died in 1618. In 1622, his successor, Chief Opechancanough, led an attack on the colonists and massacred 347 of them.

Royal Governors and Cromwell. In 1624, King James I revoked the Virginia Company's charter and made Virginia a royal colony. The colonists often quarreled with the royal governors sent by England. Sir William Berkeley, governor from 1642 to 1652, had

IMPORTANT DATES IN VIRGINIA

1607 The Virginia Company of London established the colony of Jamestown.

1612 John Rolfe helped save the colony by introducing tobacco growing and exporting.

1619 America's first representative legislature, the House of Burgesses, met in Jamestown. Dutch traders brought the first Negroes to Jamestown.

1624 Virginia became a royal colony.

1676 Nathaniel Bacon led a rebellion against the government.

1693 The College of William and Mary was founded.

1775 George Washington became commander in chief of the Continental Army.

1776 Virginia declared its independence and adopted its first constitution. Thomas Jefferson of Virginia wrote the Declaration of Independence.

1781 Lord Cornwallis surrendered at Yorktown in the final battle of the American Revolutionary War.

1784 Virginia gave up its western land claims to the United States.

1788 Virginia became the 10th state on June 25.

1789 George Washington, a Virginian, became the first President of the United States.

1792 Kentucky was formed from three of Virginia's western counties.

1801-1825 Three Virginians served as President: Thomas Jefferson (1801-1809), James Madison (1809-1817), and James Monroe (1817-1825).

1801-1835 John Marshall of Virginia served as Chief Justice of the United States.

1841 William Henry Harrison, born in Virginia, became President. Harrison died a month later. Vice-President John Tyler, also a Virginian, became President.

1849 Zachary Taylor, another Virginian, became President.

1861-1865 Virginia seceded from the Union and became the major battleground of the Civil War.

1863 West Virginia was formed from northwestern Virginia.

1870 Virginia was readmitted to the Union.

1912 Woodrow Wilson became the eighth Virginian to be elected President.

1940-1945 New industries opened during World War II, adding to the state's industrial growth.

1959 The first public school integration in Virginia took place in Arlington County and Norfolk.

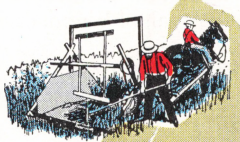
1964 The Chesapeake Bay Bridge-Tunnel connecting the mainland and the Eastern Shore was opened.

1969 A. Linwood Holton, Jr., became the first Republican to be elected governor since 1869.

1971 A new state constitution went into effect.

HISTORIC VIRGINIA

The Mother of Presidents



Cyrus McCormick invented the reaper near Walnut Grove in 1831.

GEORGE WASHINGTON

THOMAS JEFFERSON

JAMES MADISON

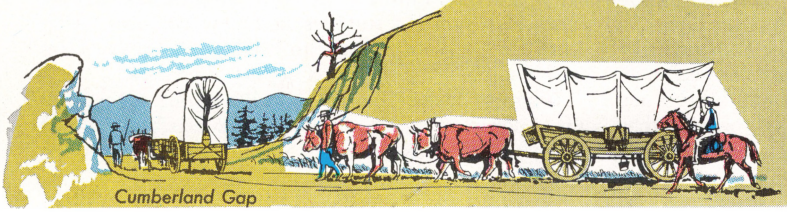
JAMES MONROE

WILLIAM HENRY HARRISON

JOHN TYLER

ZACHARY TAYLOR

WOODROW WILSON


Cumberland Gap

Cumberland Gap was the "Gateway to the West" for many early pioneers. This high pass cuts through the Appalachian Mountains.

good relations with the colonists. But in 1652, Berkeley was forced to surrender Virginia to the rule of Oliver Cromwell, who had overthrown King Charles I.

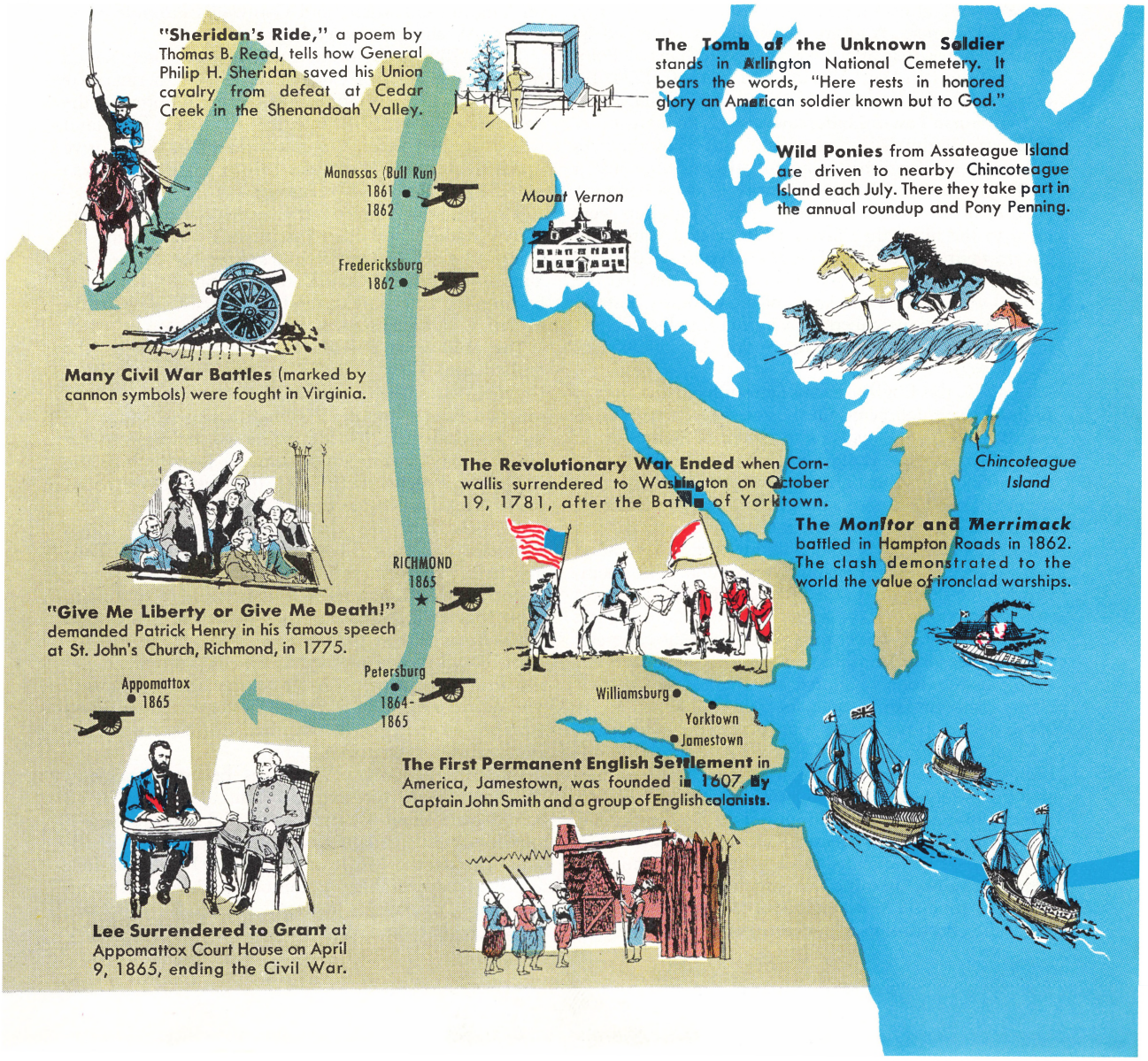
From 1652 until Charles II became king in 1660, the Virginia colonists were allowed to take almost complete charge of their own government. In spite of the political freedom they enjoyed under Cromwell, most of the colonists remained loyal to the English royalists. Some British supporters of the future King Charles II, called *Cavaliers*, sought refuge in Virginia.

In 1660, after Berkeley had been elected by the royalist Virginia assembly, Charles II reappointed him governor. Berkeley's new term brought widespread discontent. The governor kept the same members of the House of Burgesses in office for 14 years. He also allowed a *Tidewater aristocracy* to rule the colony. This group included the heads of the wealthy eastern families.

Westward Expansion. By the mid-1600's, many small farmers had pushed westward to the eastern edge of the Piedmont. This area is known as the *fall line* (see FALL LINE). The interests of the western farmers differed from those of the Tidewater aristocracy. The westerners

Bradley Smith, Photo Researchers

Virginia Military Institute's cadet barracks serve as a backdrop for the parade area. The Lexington college is sometimes called the *West Point of the South*. Its graduates have played an active part in every U.S. war since VMI was founded in 1839.



wanted protection from the Indians, and fewer political and economic regulations. They resented the British Navigation Acts, which greatly restricted colonial trade (see NAVIGATION ACT). A group of discontented colonists rebelled in 1676. They were led by Nathaniel Bacon, a young planter (see BACON'S REBELLION). In 1699, the capital was moved from Jamestown to Williamsburg.

By 1700, Virginia had a population of about 58,000 and was the largest North American colony. The growing population took up all the land along the tidal rivers and creeks. So, many pioneers moved westward into the Piedmont, the Great Valley, and the mountains. Germans and Scotch-Irish from Pennsylvania also settled in the Great Valley. The westward expansion of the English colonists conflicted with the interests of the French, and led to the French and Indian War of 1754-1763 (see FRENCH AND INDIAN WARS).

During the early 1770's, frequent Indian raids spread terror along the western frontier. In 1774, these attacks led to a campaign against the Indians called Lord Dunmore's War, after Virginia's governor, John Murray, Earl of Dunmore. A group of Virginia soldiers led by Andrew Lewis defeated the Shawnee Indians at Point Pleasant (now in West Virginia) on Oct. 10, 1774. Indian attacks then decreased in western Virginia.

The Course Toward Independence. Like many other colonists, Virginia's leaders were disturbed by the laws passed by the English Parliament without the consent of the colonies (see REVOLUTIONARY WAR IN AMERICA [Causes of the War]). Although most Virginians were loyal to the king, they favored liberty and wanted to govern their own affairs. Virginia's western leaders, including Patrick Henry and Thomas Jefferson, led the way in voicing the complaints of the colonists. Patrick Henry's resolutions, called the Virginia Resolves, helped arouse the colonists against the Stamp Act in 1765 (see STAMP ACT).

In 1774, the English Parliament ordered the port of Boston closed, following the Boston Tea Party in 1773 (see BOSTON TEA PARTY). The House of Burgesses, in sympathy with the Boston colonists, made the day of the port closing a day of fasting and prayer. This action angered Lord Dunmore, and he dissolved the House of Burgesses. Its members then met without official permission on Aug. 1, 1774, in Williamsburg. They called themselves the First Virginia Convention. The members elected delegates to the First Continental Congress (see CONTINENTAL CONGRESS). A Virginia delegate, Peyton Randolph, was chosen president of the congress.

At the Second Virginia Convention, on March 23, 1775, at St. John's Church in Richmond, Patrick Henry made his famous plea for the colonial cause: "Is life so dear or peace so sweet as to be purchased at the price of chains and slavery? Forbid it, Almighty God! I know not what course others may take, but as for me, give me liberty or give me death!"

Independence and Statehood. In 1775, the Second Continental Congress elected George Washington, a Virginian, as commander in chief of the Continental Army. Virginia became an independent commonwealth in June, 1776, when it adopted its first constitution. The constitution included a declaration of rights written by George Mason. This declaration was the first bill of rights in an American constitution. Patrick Henry was elected as the commonwealth's first governor. The capital of the commonwealth was moved from Williamsburg to Richmond in 1780.

Virginia militiamen drove Lord Dunmore from the colony after several skirmishes early in July, 1776. Also in 1776, the colony submitted to the Continental Congress a resolution calling for American independence (see DECLARATION OF INDEPENDENCE).

During the Revolutionary War (1775-1783), a larger proportion of persons in Virginia opposed the English than in any other southern colony. The Declaration of Independence was written by Thomas Jefferson, who later served as the state's second governor. Virginia also contributed the great cavalry leader "Light-Horse Harry" Lee, and Daniel Morgan, the hero of the battles of Saratoga and Cowpens. In 1778, George Rogers Clark won victories in the Northwest Territory. He took from the British Kaskaskia and Cahokia in what is now Illinois, and Vincennes in present-day Indiana. This territory had long been claimed by Virginia. In 1781, American forces won the final victory of the war on Virginia soil when Lord Cornwallis surrendered to George Washington at Yorktown.

Until 1789, the 13 former colonies were loosely joined under the Articles of Confederation (see ARTICLES OF CONFEDERATION). Virginia had *ratified* (approved) the Articles on July 9, 1778. In order to persuade Maryland to accept the Articles, Virginia promised in 1781 to give up its claim to the Northwest Territory. Virginia did so in 1784 (see NORTHWEST TERRITORY).

The Articles of Confederation soon proved ineffective. James Madison and other Virginians led in creating the Constitution of the United States to replace the Articles. Virginia ratified the Constitution on June 25, 1788, and became the 10th state of the Union. See CONSTITUTION OF THE UNITED STATES.

The Mother of Presidents. Virginia furnished the United States with four of its first five presidents—George Washington, Thomas Jefferson, James Madison, and James Monroe. Washington was elected as the first President in 1789. He appointed Jefferson as the first secretary of state, and Edmund Randolph as the first attorney general. In 1792, the westernmost counties of Virginia became the state of Kentucky.

Thomas Jefferson, James Madison, and James Monroe were often called the *Virginia Dynasty*. During their presidential terms, they strengthened the new nation and added new territory to it. Another Virginian, John Marshall, served as Chief Justice of the United States from 1801 to 1835.

In 1830, Virginia adopted a new constitution, chiefly as a result of growing discontent in the western counties. The new constitution gave the westerners more representation in the general assembly. But eastern leaders kept control of the government.

In 1841, two more Virginians became President. William Henry Harrison and John Tyler had been born in the same Virginia county. Harrison died a month after his inauguration, and Tyler became President. During the Mexican War (1846-1848), Virginia furnished many of the chief military leaders. These men included Thomas J. Jackson, Joseph E. Johnston, Robert E. Lee, and Winfield Scott. General Zachary

Taylor, known as *Old Rough and Ready*, was also born in Virginia. Largely because of his military fame, Taylor was elected President in 1848.

The western counties continued to press for reforms in government. Their demands were incorporated into the constitution of 1851. This constitution gave all white men the right to vote. It also provided for the election of the governor and other officials by popular vote. Until that time, only landowners could vote, and the general assembly had elected the governor.

The Civil War and Reconstruction. South Carolina and six other Southern states withdrew from the Union during the winter of 1860-1861. But Virginia remained in the Union. Most Virginians hoped that compromise could save the Union and prevent war. President Abraham Lincoln called for troops on April 15, 1861. Two days later, a Virginia convention voted to *secede* (withdraw) from the Union. Many westerners in Virginia would not agree to secede. They set up an independent government in northwestern Virginia that stayed loyal to the Union. On June 20, 1863, 48 counties of northwestern Virginia became the state of West Virginia. Two other counties joined them in November, 1863.

Richmond was the capital of the Confederacy from May, 1861, to April, 1865, when it surrendered to Union troops. Danville served briefly as the last headquarters of the Confederacy. Virginia's Robert E. Lee gained lasting fame as the South's outstanding military leader. The state contributed other leading Confederate generals, including Stonewall Jackson, Joseph E. Johnston, George E. Pickett, and Jeb Stuart.

The South won its greatest victories on Virginia battlefields—the first and second battles of Manassas (Bull Run), Jackson's Valley Campaign, and the battles of Fredericksburg and Chancellorsville. More battles were fought in Virginia than in any other state. Union armies repeatedly tried to seize Richmond and the Shenandoah Valley. This fertile valley was called the *Granary of the Confederacy*. The 1862 battle between the *Monitor* and the *Merrimack* (renamed the *Virginia* by the Confederate Navy) at Hampton Roads was the first fight between ironclad warships. This battle marked a turning point in naval warfare. The Civil War, like the Revolutionary War, ended in Virginia. Lee surrendered to General Ulysses S. Grant at Appomattox on April 9, 1865. See CIVIL WAR.

After the war, the federal government passed the Reconstruction Act of 1867, which placed Virginia under army rule as Military District No. 1. This act also provided for a state constitutional convention to draw up a new constitution for Virginia. The constitutional convention, headed by Judge John C. Underwood, met in December, 1867. It was controlled by Radical Republicans, and nearly a third of its members were Negroes. A constitution was adopted in 1869. It gave Negroes

THE GOVERNORS OF VIRGINIA

	Party	Term
Under Articles of Confederation		
1. Patrick Henry	None	1776-1779
2. Thomas Jefferson	None	1779-1781
3. William Fleming	None	1781
4. Thomas Nelson, Jr.	None	1781
5. Benjamin Harrison	None	1781-1784
6. Patrick Henry	None	1784-1786
7. Edmund Randolph	None	1786-1788
Under United States Constitution		
1. Edmund Randolph	None	1788
2. Beverley Randolph	None	1788-1791
3. Henry Lee	Federalist	1791-1794
4. Robert Brooke	*Dem.-Rep.	1794-1796
5. James Wood	Dem.-Rep.	1796-1799
6. James Monroe	Dem.-Rep.	1799-1802
7. John Page	Dem.-Rep.	1802-1805
8. William H. Cabell	Dem.-Rep.	1805-1808
9. John Tyler	Dem.-Rep.	1808-1811
10. James Monroe	Dem.-Rep.	1811
11. George William Smith	Dem.-Rep.	1811
12. Peyton Randolph	Dem.-Rep.	1811-1812
13. James Barbour	Dem.-Rep.	1812-1814
14. Wilson Cary Nicholas	Dem.-Rep.	1814-1816
15. James Patton Preston	Dem.-Rep.	1816-1819
16. Thomas Mann Randolph	Dem.-Rep.	1819-1822
17. James Pleasants, Jr.	Dem.-Rep.	1822-1825
18. John Tyler, Jr.	Dem.-Rep.	1825-1827
19. William Branch Giles	Democratic	1827-1830
20. John Floyd	Democratic	1830-1834
21. Littleton Waller Tazewell	Whig	1834-1836
22. Wyndham Robertson	Whig	1836-1837
23. David Campbell	Democratic	1837-1840
24. Thomas Walker Gilmer	Whig	1840-1841
25. John Mercer Patton	Whig	1841
26. John Rutherfoord	Whig	1841-1842
27. John Munford Gregory	Whig	1842-1843
28. James McDowell	Democratic	1843-1846
29. William Smith	Democratic	1846-1849
30. John Buchanan Floyd	Democratic	1849-1852
31. Joseph Johnson	Democratic	1852-1856
32. Henry A. Wise	Democratic	1856-1860
33. John Letcher	Democratic	1860-1864
34. William Smith	Democratic	1864-1865
35. Francis H. Pierpont	Republican	1865-1868
36. Henry H. Wells	Republican	1868-1869
37. Gilbert C. Walker	Republican	1869-1870
38. Gilbert C. Walker	Republican	1870-1874
39. James L. Kemper	Democratic	1874-1878
40. Frederick W. M. Holliday	Democratic	1878-1882
41. William E. Cameron	†R.-Rep.	1882-1886
42. Fitzhugh Lee	Democratic	1886-1890
43. Philip W. McKinney	Democratic	1890-1894
44. Charles T. O'Ferrall	Democratic	1894-1898
45. James Hoge Tyler	Democratic	1898-1902
46. Andrew Jackson Montague	Democratic	1902-1906
47. Claude A. Swanson	Democratic	1906-1910
48. William Hodges Mann	Democratic	1910-1914
49. Henry Carter Stuart	Democratic	1914-1918
50. Westmoreland Davis	Democratic	1918-1922
51. Elbert Lee Trinkle	Democratic	1922-1926
52. Harry Flood Byrd	Democratic	1926-1930
53. John Garland Pollard	Democratic	1930-1934
54. George C. Peery	Democratic	1934-1938
55. James H. Price	Democratic	1938-1942
56. Colgate W. Darden, Jr.	Democratic	1942-1946
57. William M. Tuck	Democratic	1946-1950
58. John S. Battle	Democratic	1950-1954
59. Thomas B. Stanley	Democratic	1954-1958
60. J. Lindsay Almond, Jr.	Democratic	1958-1962
61. Albertis S. Harrison, Jr.	Democratic	1962-1966
62. Mills E. Godwin, Jr.	Democratic	1966-1970
63. A. Linwood Holton	Republican	1970-1974
64. Mills E. Godwin, Jr.	Republican	1974-

*Democratic-Republican

†Readjuster-Republican

the right to vote, and provided for a statewide system of public schools. Virginia was readmitted to the Union on Jan. 26, 1870. See RECONSTRUCTION.

A major problem facing Virginia after the war was its debt of about $42 million. The legislature finally provided that this debt should be reduced according to the state's ability to pay. An agreement was reached with the state's creditors in 1892. This agreement reduced the debt to $27 million. It also assigned part of the debt to West Virginia. That state had been a part of Virginia when the debt was acquired (see WEST VIRGINIA [Civil War and Statehood]).

Progress in Government and Industry. Modern industry in Virginia began during the early 1880's, when cigarette factories, cotton textile plants, and shipbuilding plants were built. In 1912, another man born in Virginia, Woodrow Wilson, was elected President. Carter Glass of Lynchburg, then a congressman, became the "father" of the Federal Reserve banking system.

During the early 1900's, many Virginians moved to other states in search of better job opportunities. More than 400,000 persons left the state in the 1920's.

Harry F. Byrd served as governor from 1926 to 1930. He used the recommendations of a study commission to reorganize the state government and make it more efficient. In 1933, Byrd was appointed to the U.S. Senate, where he served over 30 years. Throughout this period, Byrd played a leading role in Virginia politics.

The 1930's were an important period of change in Virginia. Federal government activities in the state during the Great Depression created jobs and helped stop the flow of population from the state. Synthetic textile industries were established in many parts of Virginia.

The Mid-1900's. World War II (1939-1945) brought thousands of servicemen and servicewomen to the Virginia suburbs of Washington, D.C., and to the Norfolk area. Many of these people returned to Virginia to live after the war. During the 1940's and 1950's, the state also attracted many other new residents, including federal employees and employees of new industries. By 1955, it had more urban than rural dwellers.

Many Virginia communities built new schools during the 1950's. In the late 1950's, the issue of school integration became critical. In 1954, the Supreme Court of the United States ruled that compulsory segregation in public schools was unconstitutional. In 1956, the Virginia legislature passed so-called "massive resistance" laws to close any public school that the federal courts ordered integrated. In 1959, federal and state courts declared these laws invalid. That same year, public schools in Arlington County and Norfolk became the first in Virginia to integrate. But Prince Edward County closed its public schools in 1959 after a federal court ordered them to integrate. The county reopened the schools in 1964. In the late 1960's, a series of court decisions speeded up integration in the state.

Industry continued to expand in Virginia during the 1960's. The greatest growth occurred in the manufacture of chemicals, clothing, electrical equipment, furniture, and transportation equipment. In 1964, the General Assembly reduced certain taxes to attract new industry to the state. The $200-million Chesapeake Bay Bridge-Tunnel was completed in 1964. This series of bridges, tunnels, and causeways extends 23 miles (37 kilometers), and links the Norfolk area with the Eastern Shore.

The political life of Virginia changed during the 1960's. Conservative Democrats, led by U.S. Senator Harry F. Byrd, had long controlled Virginia politics. But Byrd retired in 1965, and elections became more competitive. In 1966, Virginia voters elected William B. Spong, Jr., a moderate Democrat, to the U.S. Senate. In 1967, William F. Reid became the first Negro elected to the state legislature since 1891. The Republican Party also gained strength during the 1960's. In 1969, A. Linwood Holton, Jr., became the first Republican to be elected governor since 1869.

Virginia Today is continuing to make progress in many areas. The state is building new highways, developing outdoor recreational areas, improving its schools, and trying to control water pollution. It is also promoting tourism, an $800-million business annually.

In the 1970's, Virginia faces the challenge of obtaining more money to finance its programs. In 1966, the state legislature passed a sales tax to help pay for the education and highway programs. In 1968, the voters approved an $81-million bond issue for new mental health and college facilities. But the state is depending most strongly on further industrial expansion to help meet its financial needs.

In 1970, Virginia voters approved a new state constitution. The constitution went into effect in 1971.

RAYMOND C. DINGLEDINE, JR., JOHN E. LEARD, and ANTHONY SAS

VIRGINIA / *Study Aids*

Related Articles in WORLD BOOK include:

BIOGRAPHIES

Bacon, Nathaniel
Berkeley, Sir William
Blair, John
Braxton, Carter
Byrd (family)
Byrd, Harry F.
Byrd, Richard E.
Dinwiddie, Robert
Glass, Carter
Harrison, Benjamin (1726?-1791)
Harrison, William H.
Henry, Patrick
Jefferson, Thomas
Johnston, Joseph E.
Lee, Francis L.
Lee, Henry
Lee, Richard H.
Lee, Robert E.
Madison, James
Marshall, John
Mason, George
Monroe, James
Nelson, Thomas, Jr.
Pickett, George E.
Powhatan
Prosser, Gabriel
Randolph (family)
Rolfe, John
Ruffin, Edmund
Seddon, James A.
Smith, John
Spotswood, Alexander
Stuart, James E. B.
Taylor, Zachary
Turner, Nat
Tyler, John
Washington, George
Washington, Martha Custis
Wilson, Woodrow
Wythe, George

CITIES

Alexandria
Charlottesville
Fredericksburg
Hampton
Lexington
Newport News
Norfolk
Petersburg
Portsmouth
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Roanoke Williamsburg Yorktown

HISTORY

Annapolis Convention
Civil War
Colonial Life in America
Harpers Ferry
House of Burgesses
Jamestown
Kentucky and Virginia Resolutions
London Company
Revolutionary War in America

MILITARY INSTALLATIONS

Fort Belvoir
Fort Eustis
Fort Lee
Fort Monroe
Langley Air Force Base
Norfolk Naval Base
Quantico Marine Corps Development and Education Command

PHYSICAL FEATURES

Allegheny Mountains
Appalachian Mountains
Blue Ridge Mountains
Chesapeake Bay
Cumberland Gap
Delmarva Peninsula
Hampton Roads
James River
Luray Caverns
Piedmont Region
Potomac River
Rappahannock River
Roanoke River
Shenandoah River
Shenandoah Valley

PRODUCTS

For Virginia's rank among the states in production, see the following articles:

Apple Nut Peanut Tobacco
Coal Oyster Sweet Potato

OTHER RELATED ARTICLES

Arlington County
Arlington National Cemetery
Chesapeake Bay Bridge-Tunnel
George Washington Birthplace National Monument
Monticello
Morris Plan Bank
Mount Vernon
Shenandoah National Park
Southern States

Outline

I. Government
- A. Constitution
- B. Executive
- C. Legislature
- D. Courts
- E. Local Government
- F. Taxation
- G. Politics

II. People

III. Education
- A. Schools
- B. Libraries and Museums

IV. A Visitor's Guide
- A. Places to Visit
- B. Annual Events

V. The Land
- A. Land Regions
- B. Coastline
- C. Rivers and Lakes

VI. Climate

VII. Economy
- A. Natural Resources
- B. Manufacturing
- C. Agriculture
- D. Mining
- E. Fishing Industry
- F. Electric Power
- G. Transportation
- H. Communication

VIII. History

Questions

Why is Virginia called the *Old Dominion?* The *Mother of Presidents?* The *Mother of States?*

What conditions favor industry in Virginia?

Why did the population increase in the Virginia suburbs of Washington, D.C., and in the Norfolk area during the 1940's and 1950's?

What are Virginia's chief manufactured products?

What was the *Virginia Dynasty?*

What was the *Granary of the Confederacy?*

What are some of Virginia's chief agricultural products?

What is Virginia's most important mineral resource?

What points were connected by the first U.S. toll road? When was this road built?

Books for Young Readers

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VIRGINIA, UNIVERSITY OF, is a state-controlled coeducational school in Charlottesville, Va. The university has a college of arts and sciences; schools of architecture, commerce, education, engineering and applied science, law, medicine, and nursing; and graduate schools of arts and sciences and business administration. Courses lead to bachelor's, master's, and doctor's degrees. The university also operates Clinch Valley College in Wise, Va. Clinch Valley grants the bachelor's degree. Thomas Jefferson founded the University of Virginia in 1819. For enrollment, see UNIVERSITIES AND COLLEGES (table).

See also VIRGINIA (picture); BRICK (picture).

VIRGINIA CITY, Nev., is perhaps the most celebrated and best-preserved ghost town in the West. The American author Mark Twain wrote about the turbulent early days of this former mining center in his book *Roughing It*. The town lies in the Virginia Range, 23 miles (37 kilometers) southeast of Reno. For the location of Virginia City, see NEVADA (political map).

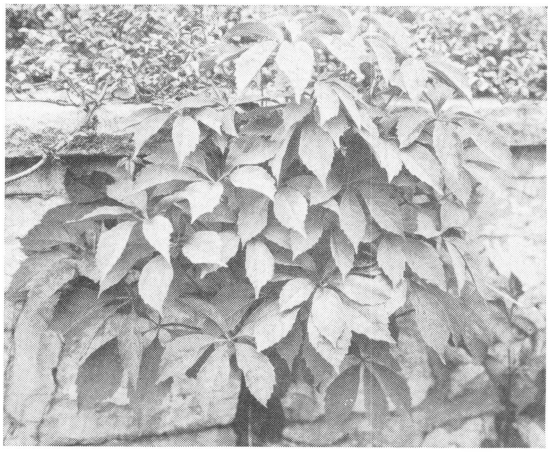
Virginia City was founded in 1859, just two years after the discovery of gold and silver in the surrounding mountains. The town's population swelled to 23,000 in 1876, at the peak of the Comstock Lode's producing power. Today, Virginia City has only about 450 permanent residents. But as many as 40,000 tourists visit the town each week during the summer. LUCIUS BEEBE

See also COMSTOCK LODE; WESTERN FRONTIER LIFE (Frontier Towns); NEVADA (color picture).

VIRGINIA COMMONWEALTH UNIVERSITY. See UNIVERSITIES AND COLLEGES (table).

VIRGINIA CREEPER is a rambling, creeping plant of the vine family. It grows in most parts of America, and is often called *woodbine*, and *American*, or *five-leaved*, ivy.

The Virginia creeper's strong but slender tendrils have long branches ending in tiny disks. The disks stick to surfaces on which the plant grows. A single tendril with five branches bearing these disks would, even after 10 years' exposure to all sorts of weather, hold up a weight of 10 pounds (5 kilograms).



J. Horace McFarland

Virginia Creeper adds brilliant color to stone fences and bare walls in autumn when its leaves turn a flaming red.

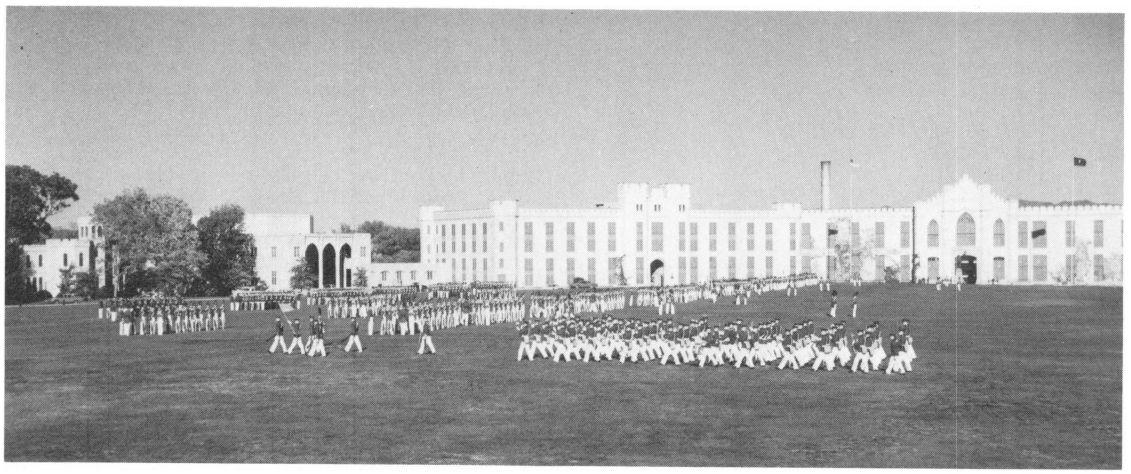
The Virginia creeper looks somewhat like poison ivy, but the leaves of the poison ivy are made up of three leaflets, and those of the Virginia creeper of five. In the autumn the Virginia creeper has flaming foliage and bunches of dark blue berries.

Scientific Classification. The Virginia creeper belongs to the vine family, *Vitaceae*. It is genus *Parthenocissus*, species *P. quinquefolia*. J. J. LEVISON

See also IVY.

VIRGINIA MILITARY INSTITUTE is a state-supported college for men in Lexington, Va. The institute offers majors in biology, chemistry, civil and electrical engineering, economics, English, history, mathematics, modern languages, and physics. Graduates receive the bachelor's degree and either a regular or a reserve commission in a branch of the United States armed forces.

Students at the institute are called *cadets*. They lead the lives of soldiers in a highly disciplined atmosphere. They wear uniforms, live in barracks, eat in a mess hall, and take part in drills and field exercises.



Virginia Military Institute

The Virginia Military Institute Campus, in Lexington, Va., includes the Cadet Barracks, *center and right,* where VMI cadets live. The cadets wear uniforms daily and drill regularly on the parade ground, *foreground.* The college is sometimes called the *West Point of the South.*

Graduates of the institute have played an active part in every U.S. war since the school was founded in 1839. Alumni have also entered almost every civilian field. From 1851 to 1861, Stonewall Jackson was a professor of artillery tactics and natural philosophy at the institute (see JACKSON, STONEWALL). General George C. Marshall graduated from the institute in 1901. The George C. Marshall Research Library on the campus contains the general's papers and souvenirs, as well as military and historical exhibits. General George S. Patton, Jr., and Admiral Richard E. Byrd also attended the institute. For enrollment, see UNIVERSITIES AND COLLEGES (table).

Critically reviewed by the VIRGINIA MILITARY INSTITUTE

VIRGINIA PLAN. See RANDOLPH (Edmund); CONSTITUTION OF THE UNITED STATES (The Compromises).

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY is a coeducational land-grant university in Blacksburg, Va. The university, which is also called Virginia Tech, has two-year branches located at Clifton Forge-Covington, Danville, and Wytheville. It offers an engineering program cooperatively with Richmond Professional Institute in Richmond. The Blacksburg campus has colleges of agriculture, architecture, arts and sciences, business, engineering, and home economics. It also has a graduate school. Both college work and technical study programs are offered at the branch colleges. The university was founded in 1872 as a land-grant college (see LAND-GRANT COLLEGE OR UNIVERSITY). For the school's enrollment, see UNIVERSITIES AND COLLEGES (table). T. MARSHALL HAHN

VIRGINIA REEL. See FOLK DANCING (Steps and Patterns).

VIRGINIA RESOLUTIONS. See KENTUCKY AND VIRGINIA RESOLUTIONS.

VIRGINIA STATE COLLEGE. See UNIVERSITIES AND COLLEGES (table).

VIRGINIA UNION UNIVERSITY. See UNIVERSITIES AND COLLEGES (table).

VIRGINIUM is a name formerly given to chemical element number 87. The element is now known as francium. See FRANCIUM.

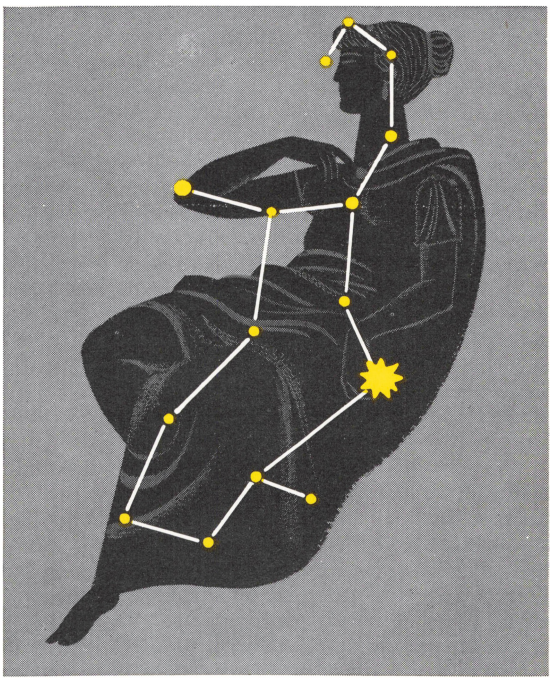
VIRGINIUS MASSACRE was an event in 1873 that almost involved the United States in a war with Spain. During a Cuban revolt against Spain, the Spanish gunboat *Tornado* captured a merchant ship called the *Virginius* on the high seas off Jamaica. A United States citizen, Captain John Fry, commanded the *Virginius*, and flew the American flag. The Spanish authorities executed Captain Fry, 36 of the crew members, and 16 passengers. The Spanish claimed that the vessel was aiding the rebels.

The affair caused great excitement in the United States. But Spain agreed to surrender the ship and survivors, and denied any hostile intent. Later, authorities discovered that the *Virginius* was owned by Cubans, was illegally registered, and had no right to fly the American flag. The vessel was wrecked and left off Cape Fear on its way to the United States. JOHN DONALD HICKS

VIRGIN'S-BOWER. See CLEMATIS.

VIRGO is the sixth sign of the zodiac. It is also the name of a constellation of stars from which the sign Virgo (meaning the *Virgin*) received its name. But the position of the stars in relation to the sun is not what it was when the zodiac was first named, and the constellation Virgo is now chiefly in the sign Libra. The sun enters the sign of Virgo about August 23. The astronomical symbol for the sign is ♍. The star Spica is near Virgo's left hand. There is a great concentration of spiral galaxies in and near Virgo. I. M. LEVITT

See also SPICA; ZODIAC; CONSTELLATION; ASTRONOMY (How to Use a Star Map).



The Constellation Virgo, the Virgin

VIROLOGY. See BIOLOGY (table); MICROBIOLOGY.

VIRTANEN, *VIR tah nen,* **ARTTURI ILMARI** (1895-1973), a Finnish biochemist, won the 1945 Nobel prize in chemistry for his researches and inventions in agricultural and nutritive chemistry. He discovered the AIV method, named from his initials, of preserving green fodder in storage by adding acids which prevent the deteriorating process. He showed that artificially acidified fodder has no harmful effect on cattle or milk. He also studied the utilization of nitrogen by plants. Virtanen was born in Helsinki.

VIRTUAL IMAGE. See LENS.

VIRUS, *VYE rus,* is a microorganism, or tiny germ. Viruses are smaller than bacteria. The largest virus can be seen through the highest power lenses of the ordinary laboratory microscope, but most viruses can be seen only with an electron microscope. All except the largest viruses pass through porcelain filters whose openings are so tiny that bacteria cannot pass through. Because of their ability to pass through filters, the smallest viruses are often called *filtrable* viruses.

Viruses are made up of a central core of nucleic acid surrounded by a protein coat. They are such incomplete organisms that they must live like parasites on

larger living cells. A virus particle attaches itself to a cell. The core of the virus penetrates and directs the life processes of the cell so that many more virus particles are formed. These new particles are then set free to attack other cells. The host cell may be injured or even destroyed by the infecting virus.

In 1898, Martinus Willem Beijerinck (1851-1931), a Dutch botanist, first recognized that something smaller than bacteria could cause disease. He isolated what he thought was a living fluid that caused disease in tobacco plants. He called his discovery *virus*, a Latin word meaning *poison*. In 1935, Wendell M. Stanley, an American biochemist, showed that viruses really are solid particles that contain protein.

Virus Diseases in Man. Doctors believe that more than 50 diseases of man are caused by viruses. These diseases include poliomyelitis, measles, chickenpox, mumps, and influenza. Viruses also cause *hepatitis* (a liver disease), *herpes simplex* (cold sores or fever blisters), and *herpes zoster* (shingles). Although scientists know that viruses cause many diseases of the respiratory tract, they have not isolated the virus that causes the common cold. Viruses cause many tumors in small animals. Some researchers believe a virus may cause cancer in human beings. However, this has not been proved. See CELL (Virus Diseases).

Treatment. Viruses are not susceptible to the antibiotics or similar drugs that are so effective against bacteria. Because viruses are associated with the life processes of the cells of the ill person, it would be difficult to destroy the virus without hurting the cells. Therefore, doctors prescribe treatments designed primarily to make the patient comfortable, and, if possible, to prevent the development of complications.

Prevention. An attack of a virus disease often makes a person immune for life. Because of this, doctors try to make people immune before they get the disease. They make vaccines from the living virus. The strength of the virus is weakened by chemicals. Doctors use such vaccines as protection against influenza, yellow fever, smallpox, and poliomyelitis. See VACCINATION.

Virus Diseases in Animals. Some viruses that cause diseases in animals apparently cannot cause disease in human beings. For example, fowl pox, swine fever, and dog distemper are limited to animals. But animals can give human beings many other serious virus diseases. For example, dogs can give people rabies. Parrots, parakeets, and pigeons can transmit psittacosis to humans.

Virus Diseases in Plants. Many plants are susceptible to virus diseases. These diseases include the various plant *mosaics*, which destroy plants important to man. Some of these plant viruses can be duplicated in a laboratory. FREDERICK C. ROBBINS

Related Articles in WORLD BOOK include:

SOME VIRUS DISEASES

Chicken Pox	Influenza	Shingles
Cold, Common	Measles	Sleeping Sickness (Encephalitis Lethargica)
Dengue	Mosaic Disease	Smallpox
Distemper	Mumps	Virus Pneumonia
Foot-and-Mouth Disease	Poliomyelitis	Yellow Fever
Hepatitis	Psittacosis	
	Rabies	

OTHER RELATED ARTICLES

Bacteria	Disease	Gnotobiotics
Bacteriology	(Virus Diseases)	Interferon

VIRUS PNEUMONIA is an infection of the lungs caused by viruses. These germs are so tiny that only the largest can be seen even under a powerful microscope (see VIRUS). Virus pneumonia has been recognized as a distinct disease only since the early 1900's.

This type of pneumonia is very contagious. Doctors believe it is spread by breathing air containing these germs. Persons with the disease may cough or sneeze, spraying into the air fine droplets with the tiny germs. If another person breathes the air with these germs he may contract the disease. X-ray pictures of persons with virus pneumonia show shadows on the lungs. Very sick patients find breathing difficult. They develop *cyanosis*, a blue condition of the skin caused by lack of oxygen. It may take seven days to several months for a person to recover from virus pneumonia. M. D. ALTSCHULE

See also PNEUMONIA.

VISA, *VEE zuh*, is an endorsement that government officials place on a passport to show that the passport is valid (see PASSPORT). Officials of the country which a traveler is entering grant the visa. It certifies that the passport has been examined and approved. Immigration officers then permit the bearer to enter the country. A government that does not want a certain person to enter the country can refuse to grant him a visa.

VISCOSE PROCESS. See RAYON.

VISCOSITY, *vihs KAHS uh tee*, is a property of fluids that causes them to resist flowing. It is caused by internal friction from the fluid's molecules moving against each other. Fluids with *high viscosity*, such as molasses, flow more slowly than those with *low viscosity*, such as water. All fluids, including liquids and gases, have some degree of viscosity. Some materials, such as pitch, that appear to be solid are highly viscous and can flow very slowly. The degree of viscosity is important in many applications. For example, the viscosity of motor oil determines how effectively it can lubricate the parts of an automobile engine.

The more strongly a fluid's molecules interact, the more viscous the fluid. Generally, the larger the size or length of a molecule, the greater the interaction. The temperature of a fluid also determines how strongly its molecules interact. Molecules in liquids interact more as the temperature decreases. Thus, hot liquids have lower viscosity than cold liquids. However, gas molecules interact more strongly at high temperatures. Hot gases have higher viscosity than cold gases.

One way to increase a liquid's viscosity is to dissolve *polymers* (long-chain molecules) in it. These molecules become entangled and resist flowing. Putting solid particles in suspension in a liquid also increases viscosity. E. D. GODDARD

VISCOUNT, *VI KOWNT*, is a title which is held by certain British noblemen. A viscount ranks below an earl and above a baron. John Beaumont, an officer and deputy to an earl, was the first to receive the title in 1440. Today it is usually given to men whom the ruler wishes to honor. See also NOBILITY.

VISHINSKY, *vee SHIN skee*, **ANDREI YANUARIEVICH** (1883-1954), was a Russian prosecutor and diplomat. He became a revolutionary in 1902 and participated actively in an uprising in 1905.

Vishinsky joined the Communist Party in 1920. From 1933 to 1938, he was a ruthless prosecutor in the Communist Party purge trials. Vishinsky became a deputy commissar of foreign affairs in 1940. He served as foreign minister from 1949 to 1953. As the chief Russian delegate in the United Nations, he became notorious for speeches against the Western world. He was born in Odessa. ALBERT PARRY

VISHNU is one of the two main gods of Hinduism. The other is Shiva. Vishnu has a kindly nature, and Hindus call him *the Preserver*. They believe he tries to ensure the welfare of mankind.

Vishnu sometimes descends from heaven to the earth in one of his *avatars* (physical forms). He does so when a catastrophe faces the universe or if mankind needs comfort and guidance. He has already appeared in nine principal avatars. The two most important ones were as the Indian prince Rama and the god Krishna. As Rama, Vishnu was the hero of the *Ramayana*, a Hindu epic. As Krishna, Vishnu took part in the *Bhagavad-Gita*, a philosophical dialogue that forms part of the *Mahabharata*, another epic. Hindus believe that Vishnu will return to the earth someday to destroy all evil and begin a new Golden Age of mankind. CHARLES S. J. WHITE

See also RAMAYANA; BHAGAVAD-GITA; HINDUISM (Divinities); MYTHOLOGY (Hindu Mythology).

VISIBILITY, DISTANCES OF. Because the earth's surface curves, we can see only a small section of its surface at one time. The higher we are, the more of the earth's surface we can see.

The U.S. Coast Guard gives the distances a person can see at various heights above sea level in clear weather. The heights and distances, given in feet and nautical miles, are:

Height (Feet)	Distance (Miles)	Height (Feet)	Distance (Miles)
5	2.5	100	11.5
10	3.6	200	16.2
15	4.4	300	19.9
20	5.1	400	22.9
25	5.7	500	25.6
30	6.3	600	28.0
35	6.8	700	30.3
40	7.2	800	32.4
45	7.7	900	34.4
50	8.1	1,000	36.2
75	9.9		

VISIGOTH. See GOTH.

VISION. See EYE.

VISITATION ORDER. See FRANCIS DE SALES, SAINT.

VISOR. See ARMOR (During the Middle Ages; picture: Armor Parts).

VISTULA RIVER, *VIS tyoo luh*, is an important waterway of east central Europe. It carries much of the river traffic in Poland. The Vistula rises in the Carpathian Mountains in southern Poland, and then takes a circular course northward. The river runs through the city of Warsaw. It empties by several branches into the Baltic Sea. Gdańsk lies at the mouth of the Nogat, the easternmost branch. See POLAND (terrain map).

Light boats sail up the river as far as Kraków. The Vistula is frozen two to three months of the year.

Canals connect the Vistula River with the Oder, the Dnepr, and the Neman, all navigable rivers. The Vistula is 678 miles (1,091 kilometers) long and drains an area of about 74,000 square miles (192,000 square kilometers). M. KAMIL DZIEWANOWSKI

VISUAL ACUITY. See EYE (Vision Tests).

VISUAL EDUCATION. See AUDIO-VISUAL MATERIALS.

VITAL STATISTICS are a record of the most basic human events—birth, marriage, divorce, sickness, and death. They indicate what is happening or what has happened to the population of a country, state, or other community. Vital statistics can also show what is likely to occur in the future. They come from birth and death certificates, marriage licenses, disease and divorce reports, and other official records. Government officials collect, tabulate, analyze, and publish these records.

Kinds of Vital Statistics. The total number of births, marriages, divorces, sicknesses, and deaths are useful statistics, but the *rate* at which they are happening is often more significant. The rate is the number of human events measured in proportion to part or all of the population. The importance of the rate can be seen in comparing births in the United States and Canada. In 1973, many more births occurred in the United States than in Canada. The United States had 3,141,000 births, and Canada, 343,000. But Canada and the United States had almost the same birth rate—15.5 births for every 1,000 persons in Canada as against 15 in the United States (see BIRTH AND DEATH RATES).

The *crude rate* is the number of events in a given year divided by the total population. The crude rate is most often stated as so many occurrences per 1,000 persons. It disregards age, sex, and other characteristics of the population. Thus a country that has a large number of young adults has a higher birth rate and a lower death rate than a country that has many older adults.

Sometimes statisticians combine several factors to study vital statistics. For example, they may relate cause of death, place of residence, color, sex, and age. They may determine the specific rate for lung cancer deaths among urban white males 20 to 44 years old per 1,000 such males in the population.

Interpreting Vital Statistics. Government workers, scientists, educators, businessmen, and others use vital statistics for many purposes. Legislators study population trends when they draft housing, employment, and other legislation. Health authorities need statistics to administer public health. Sociologists study them to learn what causes divorces. School administrators use vital statistics in planning facilities for the future. Insurance statisticians use death records to prepare life expectancy tables and life insurance rates. Market researchers study statistics to make marketing plans.

Collecting and Publishing Vital Statistics. In the United States, state laws regulate registration of vital records. Physicians, funeral directors, clergymen, and attorneys most commonly register such records. Doctors or hospital attendants file birth certificates with local registrars. Doctors or coroners return death certificates to funeral directors who file them with local registrars to obtain burial permits. The local registrars send birth and death certificates to their county health department or to the state registrar. Doctors also report cases of disease to local or state health departments.

Town or county clerks issue marriage licenses. After the ceremony, the minister or other marriage officer sends the record certifying the marriage to the license clerk. The licensing office sends the marriage record or a copy to the state registrar. Attorneys file divorce records with the clerk of the court that granted the decree. The court clerk reports the divorce to the state registrar.

State bureaus of vital statistics and state health departments maintain files of vital records and compile statistics. The state governments send reports of births, deaths, *fetal deaths* (stillbirths), diseases, marriages, and divorces to the National Vital Statistics Division of the National Center for Health Statistics. The center is a Public Health Service agency in the United States Department of Health, Education, and Welfare. The division tabulates, analyzes, and publishes national data. The Public Health Service publishes the annual *Vital Statistics of the United States*, the *Monthly Vital Statistics Report*, and other statistical data.

The United States and other countries report vital statistics to the Statistical Office of the United Nations. The UN issues the annual *Demographic Yearbook* and other statistical publications.

See also CENSUS; DIVORCE; MARRIAGE; POPULATION.

VITAMIN, *VYE tuh min*, is a complex substance that is essential to the human body for health and growth. But human beings do not need vitamins for fuel. Fuel is supplied by fats and carbohydrates. The human body makes some vitamins itself, but often in amounts too small to meet its needs. Others are not made in the body at all, and must be supplied. All the functions of many of the vitamins are not completely known. But doctors do know that vitamins have such specific uses that one cannot replace, or act for, another. The continued lack of one vitamin in an otherwise complete diet results in a *deficiency* disease, such as rickets, scurvy, and pellagra. See DISEASE (Nutritional Diseases).

The best way to obtain vitamins is to eat foods in which they occur naturally. There are also preparations of pure vitamins that contain a single vitamin, or a combination of several vitamins. Vitamin preparations should be used only if prescribed by a doctor.

Scientists have discovered about 25 different vitamins that are important to the nutritional needs of human beings, animals, and microorganisms. Investigators believe that further study will show there actually are many more vitamins.

Kinds of Vitamins

Scientists divide vitamins into two general classes. One group, the *fat-soluble* vitamins, dissolves in fats. Among these are vitamins A, D, E, and K. The other group, the *water-soluble* vitamins, dissolves in water. Vitamin C and the B-complex vitamins are among these. Many vitamins have two or more names. As the vitamins were discovered, researchers often named them for the letters of the alphabet. But when investigation allowed scientists to break them down chemically, the more descriptive chemical names were given.

Vitamin A was the first fat-soluble vitamin to be discovered. It occurs only in animals. However, several substances that occur in plants are converted into vitamin A by the body. These plant substances are called *carotenes*, or *provitamins* A. An abundance of vitamin A is supplied by carrots, spinach, sweet potatoes, milk, liver, egg yolk, and green and yellow vegetables.

Vitamin A aids in the building and growth of body cells. Because of this, it is essential for the growth of children and for normal development of babies before birth. It is especially needed for bone growth and for normal tooth structure. Vitamin A helps build resistance to infection, and keeps the skin healthy. It also helps the eyes to function normally in light that varies in intensity. For example, when a person enters a darkened room from the sunlight, his eyes must adjust to the limited indoor light so that he can see. Persons without enough Vitamin A may also develop *xerophthalmia*, a condition in which the surface of the eye becomes dry and likely to develop infection.

Vitamin B Complex is a group of more than 15 known water-soluble vitamins. The vitamins that make up this group were first believed to be only one vitamin. Researchers later found that several different vitamins make up the vitamin B complex.

Vitamin B_1, also called *thiamine*, prevents and cures beriberi, a disease of the nervous system (see BERIBERI). It contains sulfur and nitrogen. Good sources of vitamin B_1 are yeast, meats (especially pork), whole-grain and enriched cereals, soybeans, nuts, peas, and green vegetables. Like vitamin A, this vitamin is needed for growth. The body also needs vitamin B_1 so that it can change carbohydrates into energy (see CARBOHYDRATE). People need vitamin B_1 to have a good appetite and to prevent fatigue.

Riboflavin, or *vitamin B_2*, is most abundant in such foods as yeast, milk, liver, eggs, poultry, fish, and green and leafy vegetables. This vitamin is needed for growth, for healthy skin, and for the proper functioning of the eyes. It also promotes the body's use of oxygen. When a person does not get enough of this vitamin, cracks may develop in the skin at the corners of his mouth. He may also have inflamed lips and a sore tongue, and scaliness of the skin around his nose and ears. His eyes may become very sensitive to light.

Niacin, also called *nicotinic acid*, helps prevent pellagra (see PELLAGRA). The best sources of niacin are lean meat, whole-grain and enriched cereal and bread, and green vegetables. Milk and eggs, even though they have little niacin, are good pellagra-preventive foods because they contain *tryptophane*, an amino acid (see AMINO ACID). Tryptophane substitutes for some of the body's niacin needs. Niacin is essential to growth and to the proper use of oxygen. Without it, thiamine and riboflavin cannot function properly in the body. Persons without enough niacin may develop disorders of the alimentary canal, the skin, and the nervous system.

Vitamin B_{12}, or *cyanocobalamin*, contains *cobalt*, a mineral important in the nutrition of people and animals. Scientists do not know all the things vitamin B_{12} does for the body. But investigators have found that injections of tiny amounts of this vitamin help in treating persons with pernicious anemia (see ANEMIA). Eggs, milk, meat, liver, and other animal proteins supply vitamin B_{12}. Researchers have found that persons who eat only vegetables sometimes lack vitamin B_{12}. However, even a small amount of animal protein seems

VITAMIN	WHAT IT DOES	SOURCES	RECOMMENDED DAILY AMOUNT ADULTS	CHILDREN
A	Helps maintain skin, eyes, urinary tract, and linings of the nervous, respiratory, and digestive systems. Needed for normal growth of bones and teeth, and for good night vision.	Sweet potatoes, milk, liver, fish liver oils, eggs, butter, green and yellow vegetables.	5,000 I.U.	1,500-5,000 I.U.
B_1 (thiamine)	Needed for carbohydrate metabolism and release of energy from food. Helps heart and nervous system function properly.	Yeast, meat, whole-grain cereals, nuts, soybeans, peas, potatoes, most vegetables.	1-1.6 mg	0.4-1.8 mg
B_2 (riboflavin)	Helps body cells use oxygen. Promotes tissue repair and healthy skin.	Milk, cheese, liver, heart, fish, poultry.	1.5-2.5 mg	0.5-2.5 mg
Niacin	Essential for cell metabolism and absorption of carbohydrates. Helps maintain healthy skin.	Liver, yeast, lean meat.	17-21 mg	6-25 mg
B_6	Needed for healthy teeth and gums, blood vessels, nervous system, and red blood cells.	Yeast, whole-grain cereals, meat, wheat germ, most vegetables.	1-2 mcg	1-2 mcg
B_{12}	Essential for proper development of red blood cells. Helps proper function of nervous system.	Eggs, meat, milk, milk products.	1-3 mcg	1-3 mcg
Biotin	Needed for healthy circulatory system and for maintaining healthy skin.	Eggs, liver, kidney, most fresh vegetables.	unknown	unknown
Folic Acid	Needed for production of red blood cells.	Green leafy vegetables, yeast, meat.	0.5-1 mg	0.5-1 mg
C (ascorbic acid)	Essential for sound bones and teeth. Needed for tissue metabolism and wound healing.	Citrus fruits, tomatoes, raw cabbage, potatoes, strawberries, cantaloupe.	70-150 mg	30-100 mg
D	Essential for calcium and phosphorus metabolism.	Fish liver oils, fortified milk, eggs, tuna, salmon, sunlight.	400 I.U.	400 I.U.
E	Helps maintain heart and skeletal muscles, and may help maintain reproductive system.	Whole-grain cereals, lettuce, vegetable oils.	7-10 mg	unknown
K	Needed for normal blood clotting.	Leafy vegetables; made by intestinal bacteria.	1 mg	unknown

mg = milligrams; I.U. = International Units; mcg = micrograms.

to be able to supply enough of this important vitamin.

Other B-Complex Vitamins have been discovered, including *pyridoxine* (B_6); *pantothenic acid; biotin* (vitamin H); *folic acid; para-aminobenzoic acid;* and *inositol*. Scientists have studied many of these vitamins extensively, but most of them are still under investigation. Doctors know that several are essential to human nutrition. They have found that a varied diet that contains thiamine, riboflavin, and niacin seems also to supply the other vitamins of the B-complex group.

Vitamin C, or *ascorbic acid*, is a water-soluble vitamin. Doctors sometimes call it the *antiscorbutic* vitamin because it prevents and cures scurvy (see SCURVY). The body does not store vitamin C. Therefore, it must be supplied daily in the diet. Good sources are citrus fruits, tomatoes, raw cabbage, strawberries, and cantaloupe. The fruit of the acerola, or Puerto Rican cherry, has the highest concentration of vitamin C known. Vitamin C is essential for healthy blood vessels and sound bones and teeth. Persons who lack this vitamin may have sore gums, hemorrhages under the skin, and general fatigue.

Vitamin D is a group of about 10 fat-soluble vitamins that prevent rickets (see RICKETS). The vitamins in this group are produced from certain *sterols* found in plants and animals by exposure to ultraviolet light. Only two of these vitamins are important in nutrition. One is vitamin D_2, formed by irradiating *ergosterol*. The other, vitamin D_3, occurs in fish-liver oils, irradiated milk, and all irradiated animal foodstuffs (see COD-LIVER OIL). Scientists believe that vitamin D_3 forms in the skin when the body is exposed to sunlight. Because of this, it has been called the "sunshine vitamin." Doctors have found that lack of vitamin D leads to serious bone changes. However, they have found that excessive amounts also cause serious bone changes. They call this condition *hypervitaminosis D*.

Vitamin E, or *tocopherol*, is a fat-soluble substance that scientists believe may be necessary for reproduction. All the functions of this vitamin are not known. The best sources of vitamin E are wheat-germ oil and lettuce. Whole-grain cereals, meat, milk, eggs, liver, and most vegetables also contain it.

Vitamin K includes a group of fat-soluble vitamins that are essential for making the blood clot. These vitamins are rather abundant in food. They are found particularly in the green leafy vegetables, such as spinach, cabbage, kale, and cauliflower. Pork liver is also an excellent source. Intestinal bacteria manufacture vitamin K in the body. Therefore, deficiencies of this vitamin are rarely the result of poor diet. But deficiencies can result when something interferes with the normal function of the intestines. Doctors sometimes give mothers vitamin K before childbirth as a precaution against hemorrhages in the newborn baby.

History

Diseases such as scurvy, rickets, and beriberi have been known for centuries. But the idea that they might be due to a *deficiency* (lack) in diet is comparatively new. One of the earliest men to realize this was Kanehiro Takaki (1849-1915), surgeon general of the Japanese Navy. In 1882, he greatly reduced the number of beriberi cases among naval crews by adding meat and vegetables to their diet of rice. Christiaan Eijkman (1858-1930), a Dutch medical officer in the East Indies, studied beriberi in prison camps. About 1900, he and a co-worker showed that people who ate *polished* rice (with the hulls removed) developed the disease. Those who ate whole rice, hull and all, did not. They stated that rice hulls contain a factor necessary to health.

Casimir Funk (1884-1967), a Polish biochemist working in London, tried to isolate this anti-beriberi factor from rice hulls in 1912. He did not manage to get it pure. From his studies, he thought it belonged to a class of chemical compounds called *amines*, and named it *vitamine* (amine essential to life). Meanwhile, Frederick G. Hopkins (1861-1947), of Cambridge University in England, had published his work in 1906 showing the effect of diet on the growth of rats. He stated that substances called "accessory food factors," found in certain foods, were essential for growth and normal development. The word *vitamin* (with the *e* dropped) came to be used to cover all substances of this type. At first, scientists thought only two existed, water-soluble vitamin and fat-soluble vitamin. Elmer V. McCollum (1879-1967), an American biochemist, showed that the fat-soluble vitamin actually consisted of a mixture of vitamins. Joseph Goldberger (1874-1929), an American physician, showed that the water-soluble vitamin was also a mixture. Since then, many vitamins of both types have been isolated and identified. But scientists believe still others may be discovered. LORD TODD

Related Articles in WORLD BOOK include:

Citrin
Diet
Food (How Our Bodies Use Food)
Goldberger, Joseph
McCollum, Elmer V.
Nutrition (with Science Project)

VITERBO COLLEGE. See UNIVERSITIES AND COLLEGES (table).

VITREOUS HUMOR. See EYE (The Eyeball; color diagram: Parts of the Eye).

VITRIOL, OIL OF. See SULFURIC ACID.

VIVALDI, *vee VAHL dee*, **ANTONIO** (1677?-1741), was a famous Italian violinist and composer. He is reported to have written nearly 50 operas. But he is probably best known for his instrumental compositions, including sonatas for one or two violins, and concertos for various instruments. Some of these concertos express a poetic program, such as the Concerto for Five Instruments, called *La Pastorella*, and *Le Quattro Stagioni*, (*The Four Seasons*). Johann Sebastian Bach, who deeply admired Vivaldi's works, took over some of the features of formal construction from Vivaldi's concertos. Bach also arranged several of Vivaldi's compositions for the harpsichord and the organ. Vivaldi was born in Venice. KARL GEIRINGER

VIVARIUM, *vih VAIR ih um*, is a small indoor enclosure for animals or plants, or both. It usually has glass sides and may hold earth and water for such animals as small turtles or frogs. See also TERRARIUM.

VIVIPAROUS ANIMAL, *vy VIP uh rus*, is an animal whose young are born alive. This, in general, is true only of the higher animals. Most fish hatch from eggs, but a few, such as the guppy, are born alive. Some snakes bear live young, but others lay eggs.

VIVISECTION, *viv ih SEK shun*, is the practice of operating on live animals to study facts used to advance medical science. The literal meaning of the word is *cutting of the living*. The strict meaning takes in only cutting operations, but the word also covers many types of operations in which animals are used for experiments. Examples include experiments with new medicines, with disease germs, and in nutrition and diet studies. Another term for vivisection is *animal experimentation*.

People often object to vivisection because they feel it is cruel. But enormous benefits result from vivisection. Few of the great discoveries of medical science would have been possible without it. Through animal experiments, scientists discovered the antitoxin which prevents and cures diphtheria, and the anesthetic properties of ether and chloroform. They learned how to prevent death from diabetes by the manufacture and injection of insulin; how to develop and test out such antibacterial agents as sulfonamides, penicillin, tetracycline, and many others; and how mosquitoes spread yellow fever. There is hardly any field of medical practice that has not been advanced by vivisection.

Scientists do everything they can to carry out animal experiments in a humane way. When they operate, they use an anesthetic to make the animal unconscious. As far as possible, the scientists make their investigations while the animal is unconscious. If the animal is seriously mutilated, they kill it before it becomes conscious again. WARREN H. COLE

See also ANTIVIVISECTION; GUINEA PIG.

VIZCAÍNO, SEBASTIÁN. See CALIFORNIA (Spanish and English Exploration).

VIZCAÍNO DESERT is a vast, sparsely inhabited wasteland in central Baja (Lower) California, Mexico's long peninsula. It covers about 6,000 square miles (16,000 square kilometers), from about Rosario in the north to La Paz in the south. The desert has an average annual rainfall of less than 5 inches (13 centimeters). In some years, no rain falls. JOHN A. CROW

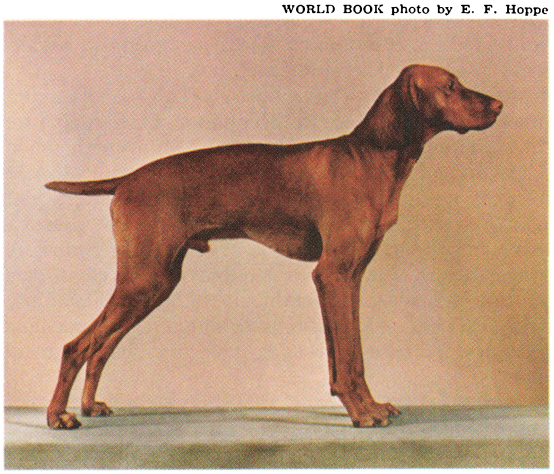
VIZIER, *vih ZEER*, or *VIZ yer*, is the title some Moslem countries give to certain high officials, such as ministers of state. The word *vizier* comes from the Arabic word *wazir*, which means a *bearer of burdens*. The viziers headed the departments of government in the Ottoman Empire. During the 1800's, the highest officer of the realm was the grand vizier, who was somewhat like a prime minister. SYDNEY N. FISHER

VIZSLA, *VEEZ lah*, is a short-haired hunting dog also known as the *Hungarian pointer*. Vizslas resemble other short-haired pointing breeds except that they have deep, rusty-gold coats. The dog weighs about 50 pounds (23 kilograms) and has a *docked* (shortened) tail.

Dog experts believe the breed is descended from dogs that were brought into central Europe by the Magyars about 1,000 years ago (see MAGYAR). Central Europeans first used the dogs to hunt with falcons, and later to point and retrieve game birds on the Hungarian plains. JOSEPHINE Z. RINE

The Vizsla Is a Powerful Hunting Dog.

WORLD BOOK photo by E. F. Hoppe



VLADIMIR I (?-1015), a Russian grand duke, won fame for establishing Christianity as Russia's official religion. In 972, he became ruler of Novgorod in Russia, but had to flee for his life to Scandinavia. Later, he returned, defeated and killed his brother, who was ruling in Kiev, and became grand duke in Kiev.

Vladimir was born a pagan of Viking origin. In about 988, he was converted to Christianity. He married Anna, the sister of the Byzantine emperor Basil II. Vladimir I founded cities and built churches, schools, and libraries. He promoted trade, established relations with the pope and European rulers, and ably defended Russia against its eastern neighbors. Vladimir I died in 1015, and later was declared a saint. W. KIRCHNER

VLADIVOSTOK, *VLAH dih vahs TAWK* (pop. 456,000), is the most important Russian port on the Pacific Ocean. It lies in southeastern Siberia, near the Korean border (see RUSSIA [political map]).

Vladivostok's fine harbor, formed by the Bay of the Golden Horn, has an area of about 2 square miles (5 square kilometers). The harbor is usually frozen between January and March, but icebreakers keep it open. Vladivostok is a base for fishing fleets. Most goods coming to Russia from Pacific ports pass through Vladivostok. The city has shipyards and fish canneries. It also produces mining equipment. Vladivostok lies near the east end of the railroad line that crosses Siberia (see TRANS-SIBERIAN RAILROAD). Russians founded Vladivostok in 1860. It became a naval base after Russia lost Port Arthur to Japan in 1905. Today, most of its merchant fleet uses the port of Nakhodka. THEODORE SHABAD

VLAMINCK, *vlah MANK*, **MAURICE DE** (1876-1958), was a French artist. With André Derain and Henri Matisse, he was a leader of the fauvist movement in the early 1900's. Vlaminck was influenced by the paintings of the Dutch artist Vincent Van Gogh. Like Van Gogh, he used slashing brushstrokes and brilliant colors to increase the dramatic impact of his work. However, the exuberant quality of Vlaminck's work contrasted sharply with the feeling of suffering in many of Van Gogh's paintings. See FAUVES.

From about 1908 to 1914, Vlaminck painted under the influence of the French artist Paul Cézanne and of cubism. About 1915, Vlaminck developed a different style from that of his earlier works. He began painting gloomy landscapes that emphasized heavy, dark colors and the illusion of deep space. He also created many etchings and lithographs in this style. Vlaminck was born in Paris. WILLARD E. MISFELDT

VOCABULARY is the total number of words in a language. It is also the collection of words a person knows and uses in speaking or writing.

The vocabulary of a language is always changing and growing. As life becomes more complex, people devise or borrow new words to describe man's activities. The total vocabulary of the Anglo-Saxon language, from which English stems, included roughly 50,000 words. No one knows the exact number of words in the English vocabulary today, but it contains at least 600,000 words.

A person has two kinds of vocabularies. His *active* or *use* vocabulary consists of words he uses in speaking or writing. His *passive* or *recognition* vocabulary consists of words he understands when listening or reading. A person's recognition vocabulary is often many times larger than his use vocabulary. This means he understands words he hears or reads that he does not habitually use in speaking or writing. For Americans, the average use vocabulary is 10,000 words, but the average recognition vocabulary is 30,000 to 40,000 words.

A person builds his vocabulary throughout his life. Studies have shown that a child entering school may know only from 3,000 to 4,000 words. But by the time he has completed college, he may use or understand from 10,000 to 30,000 words.

The range of a person's vocabulary is a clue to his culture, education, and general intelligence. Control over words is often the same as control over the ideas the words represent. The dictionary is an important tool for increasing your vocabulary. If you encounter a word you do not know, look it up and find out what it means and how it is used. MARIO PEI

See also BASIC ENGLISH; DICTIONARY; READING.

VOCAL CORD. See LARYNX.

VOCAL MEMNON. See MEMNON.

VOCATION. See VOCATIONS.

VOCATIONAL EDUCATION

VOCATIONAL EDUCATION is any kind of training that helps a person to make a success of his job. A girl who takes courses in typing and shorthand may become a successful stenographer, department head, and even an executive, in her firm. A boy who learns how to operate a lathe may become a machine shop foreman, and finally head of his own business. Vocational education—in school or on the job—can make a real difference in a person's life. It can also make a real difference in a nation's life. Knowledge, skill, and training often make up a country's greatest resource.

Kinds of Vocational Education

Apprenticeship teaches a young person all phases of a skilled trade, both on the job and in the classroom (see APPRENTICE). Suppose a young man decides on a job that calls for apprenticeship. He must usually join a labor union to become an apprentice. Union officials and the employer agree on a training schedule for apprentices. This schedule specifies the number of hours the apprentice must spend learning each basic process in the trade. It also specifies the order in which basic processes may be learned best and the amount of time needed to become a full-fledged craftsman. Apprenticeship often includes courses in technical schools. The employer pays for the apprentice's training. The apprenticeship agreement also specifies the wages the man will receive during his training. See LABOR.

To qualify for apprenticeship in any skilled trade, a young man should have better than average ability to use his hands, as well as his head. Applicants must often take tests, and high school graduates are usually preferred. The required age for an apprentice ranges from 16 to 24. But a war veteran over 24, or an older worker with unusual ability, may often win acceptance.

High Schools train young people for many different jobs. High school training programs may be *comprehensive* or *specialized*. For example, a high school program may give a youngster comprehensive training that will help him begin a career in bookkeeping. Or, it may give him specialized training in such subjects as electronics or mechanical drawing. Both programs operate in the belief that persons who have completed their high school education will be able to get better jobs.

A high school counselor usually assists each student to understand the facts about the student's interests and aptitudes. He helps the student to use these facts to his best advantage. With the help of the counselor, a student can choose his courses so that they form a sound basis for later job preparation.

This later preparation can take place on the job itself, at college, or in a vocational, technical, or professional school. The student may find that he needs training in English, mathematics, science, social studies, art, shop, or other subjects. He may find that knowledge of other related subjects will help him in his work.

A student who plans to go to work immediately after finishing high school may gain much by attending a *technical*, or *vocational*, *high school*. This kind of school combines courses in such general subjects as English and mathematics with special job training. A student learns by doing as well as by studying. The schools maintain well-equipped shops for teaching automobile repair, electronics, machine use, carpentry, and other trades. They often have home economics departments and scientific laboratories. At the same time, a student does not lose a general education.

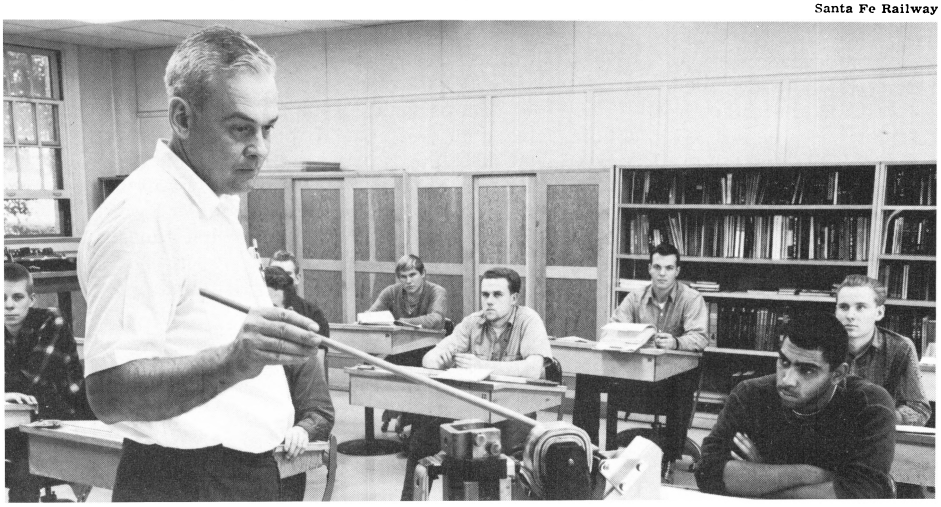
Apart from technical schools, a high school student may often prepare for an occupation by participation in activities outside the classroom. Many high school clubs and organizations help a student try out the kind of work he thinks he might like. For example, a high school photography club can give a student practical experience in photography. The 4-H clubs contribute much to the education of students interested in agriculture (see 4-H). Arts, crafts, hobbies, and other activities also help a student to find himself. They may give him new interests or broaden those interests he already has.

Night Schools. Many universities, colleges, high schools, and other institutions offer vocational courses in the evening. These courses meet the needs of men and women who work in the daytime. The courses may include such skilled subjects as electronics, fashion design, mechanical drawing, and toolmaking. These courses often help a person to obtain a better job or to improve his present skills. See NIGHT SCHOOL.

Business Colleges offer training in most of the larger cities in the United States and Canada. Most schools known as business colleges are private. Similar courses are offered by junior colleges and technical schools. They aim at giving a student a knowledge of business

Donald E. Super, the contributor of this article, is Professor of Psychology and Education, Teachers College, Columbia University and author of Psychology of Careers.

Santa Fe Railway



Vocational Education classes provide the basic training that students will need to qualify for jobs as skilled craftsmen or tradesmen.

English, bookkeeping, business arithmetic, commercial law, shorthand and typing, and the use of various office machines. They help a student to begin a career in business or to qualify for a better job.

Correspondence School Courses help many persons to use their leisure time to prepare themselves for a chosen career. A man or a woman with a regular, full-time job may find it advisable to take a correspondence course to improve his chances of advancement.

Correspondence courses cover subjects in many different fields. They allow the student to progress as rapidly or as slowly as he chooses. His study, and sometimes his practical experience or experimental work, takes place at home. The correspondence school handles examinations, written work, and reports by mail. It takes considerable self-discipline to complete a correspondence course successfully. But this education has helped many persons to equip themselves for better jobs.

On-the-Job Training. Many larger business establishments and industrial plants provide on-the-job training for employees. This kind of training helps an employee to learn valuable skills and to become more efficient. It also gives him a chance to advance to a better job. Training programs vary widely. Many companies have regular teachers and a departmental director to organize and conduct the instruction program.

Technical Schools and Institutes. Many private and public schools offer highly specialized vocational training to students of high school age or older. These institutions are called *technical schools*, *technical institutes*, or *trade schools*. This kind of training is often called *terminal training*, because many students have had several years of high school, and the training prepares them for immediate employment in a certain job. For example, a trade school might prepare a student for immediate employment as a television repairman. Technical and trade schools usually teach a student only the skills he needs for a certain job.

Many junior colleges offer terminal training programs. These programs resemble the instruction given in trade and technical schools, and equip a student for immediate employment. See JUNIOR COLLEGE.

Universities and Colleges offer many kinds of vocational training. A young man or woman who wishes to join such professions as engineering, law, or medicine must usually attend a university or college. Most universities contain regular schools for such subjects as art, architecture, business administration, journalism, and many others. Many universities and colleges—particularly state-supported schools—have special training programs for certain kinds of jobs; for example, police work or textile manufacturing. Apart from special programs, entrance to a university or college usually requires graduation from a high school or preparatory school. See UNIVERSITIES AND COLLEGES.

Teaching Methods

In vocational education, teachers find that both high school and adult students learn best by actually doing work under job conditions. An atmosphere of reality makes learning and remembering easier. Doing the same task a number of times also helps in learning.

Teachers in vocational education usually specialize in teaching certain jobs. For example, teachers may specialize in automobile repair, basic electricity, cabinetmaking, or welding. They teach by means of lectures, discussions, demonstrations, and experiments. Perhaps of greater importance, they guide the students in actually doing work and in carrying out projects. A teacher must use many different methods to give his students the skill and knowledge they need.

Most teachers in this field have had experience in their trade prior to teaching. A good vocational teacher is never really parted from his occupation. He keeps abreast of changes and improvements in order to teach the latest methods.

History

In prehistoric times, parents and elders taught children all the skills they needed for everyday life. The custom of apprenticeship began in ancient times. By about 2500 B.C., boys in ancient Babylonia and Egypt were apprenticed to master craftsmen who taught them such trades as carpentry, pottery making, and weaving. Apprenticeship continued through the Middle Ages. A boy usually had to spend seven years with a master craftsman. Then he had to pass a test to become a *journeyman*, or skilled worker.

The Industrial Revolution of the 1700's and 1800's marked the decline of apprenticeship (see INDUSTRIAL REVOLUTION). The new factories did not need so many highly skilled workers. But a number of charitable organizations organized classes for men and women in factories. For example, in about 1800 George Birkbeck (1776-1841), an English physician, began lectures for mechanics. This became the *mechanics institute movement* in Great Britain and the United States. Many thousands of workers attended lectures on the arts and sciences, given by the mechanics institutes. Another movement, called the *lyceum movement*, sponsored lectures throughout the United States (see LYCEUM).

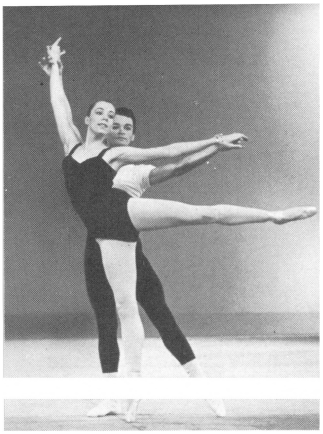
In the United States, the *academies* of the 1700's and 1800's introduced vocational education in a number of fields, such as navigation and surveying (see ACADEMY). After 1800, public high schools began to replace academies in popularity. Even the first high schools offered vocational training. After 1862, the federal government helped the states establish agricultural and mechanical colleges that specialized in vocational training. A whole series of federal acts extending from the 1900's to the 1950's helped agricultural education. Federal aid to veterans of World War II and the Korean War helped many young men to obtain on-the-job training. In 1963, a $1½ billion bill expanding federal aid to vocational education was passed. It was to help meet the need for skilled technicians created by machines that do the work of the unskilled worker and must be maintained by skilled workers. Vocational education is being changed to meet these needs. DONALD E. SUPER

Related Articles in WORLD BOOK include:

Adult Education	High School
Agricultural Education	Industrial Arts
Business Education	Junior College
Correspondence School	Night School
Education	Vocations
Guidance	

VOCATIONAL EDUCATION ACT. See SMITH-HUGHES ACT.

VOCATIONAL GUIDANCE. See VOCATIONS.



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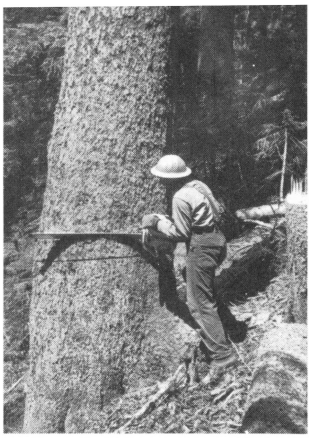

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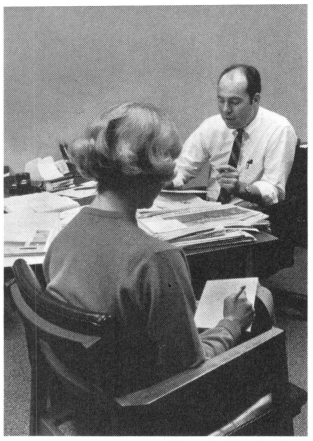

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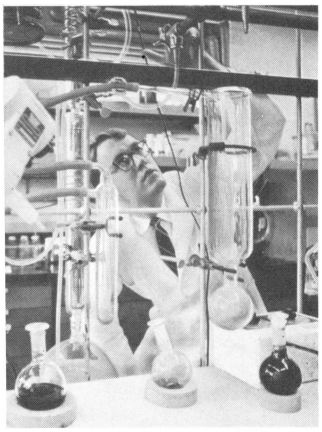
H. Armstrong Roberts



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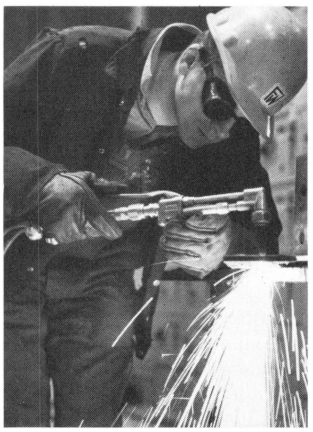


Harold M. Lambert

Public Schools, Madison, Wis.

VOCATIONS

VOCATIONS are the occupations, professions, or trades in which people work. There are thousands of vocations. They vary greatly in both the type of work involved and the education and training required. Everyone hopes to get a job that he will find interesting, enjoyable, and rewarding. Obtaining the proper information and making careful plans are important steps in reaching this goal.

When you choose a vocation, you make one of the most important decisions of your life. A vocation can offer adventure, challenge, and accomplishment. It can also present uncertainty, difficulty, and disappointment.

When choosing a vocation, you should also plan your *career*. A career includes the preparation for a vocation and the various stages of advancement through one vocation or through a series of vocations. What is done at one stage of a career—as a student, as an apprentice, or as a full-fledged member of a vocation—affects what is done during the following stages.

In planning for a vocation and a career, one of the most important things you should do is learn about yourself. Interests, abilities, needs, desires, and attitudes—all these help determine success and happiness in a vocation. You should find out what kinds of work you might be able to do best, and what kinds you might enjoy most. You also should form a personal definition of success, and establish a set of personal goals.

Another important factor in planning for a vocation is to know about the jobs that are available and the opportunities they offer. It is necessary to know how to find a job, and how to get off to a good start in one. Before entering a vocation, you should try to get a clear picture of all the factors involved in it.

There are so many vocations that it is almost impossible to obtain detailed information about each one. But most vocations can be classified in various ways with similar ones. By using these classifications, you can obtain descriptions of a large number of occupations, along with lists of related, but less common, jobs.

A third requirement in planning for a vocation is an awareness of our rapidly changing world. Advances in education and technology are continually changing the nature of many vocations. It is not easy to predict such changes, but making the best possible use of the best available information can be a valuable aid.

This article tells about various types of vocations. It provides information that can be used to plan a vocation and a career. It describes how a person can determine his abilities, interests, and attitudes, and how these factors can affect his career. The article also classifies occupations according to the type of work involved and the amount of training needed. It tells how to predict and adjust to changes, and it gives sources of additional information about many vocations.

Donald E. Super, the contributor of this article, is Professor of Psychology and Education at Teachers College, Columbia University, and the author of The Psychology of Careers.

The choice of a vocation and a career is a process that takes place over a long time and requires many decisions. The best possible choice is more likely to be made if the process is planned and guided. Help in vocational guidance can come from professional counselors, teachers, parents, and adult friends. Information on how and where to get such help is given in a later section of this article.

Why Work? Most people work primarily to earn a living. But people also work for other reasons. For example, they work to gain *status* (professional or social standing), or to achieve self-expression. An individual's reasons for working depend greatly on his economic position. For someone on a low economic level, earning a living is the most important—and perhaps the only—reason for working. A person on a higher economic level may be able to seek satisfaction and status in a job.

For many people, earning a living means earning barely enough to pay for food, clothing, and shelter from day to day. For others, it may mean earning enough to provide a suitable standard of living. These earnings are called *current earnings*. What is considered "suitable" differs from person to person. It depends on what the individual has had, what others have, and what he believes he might have in the future.

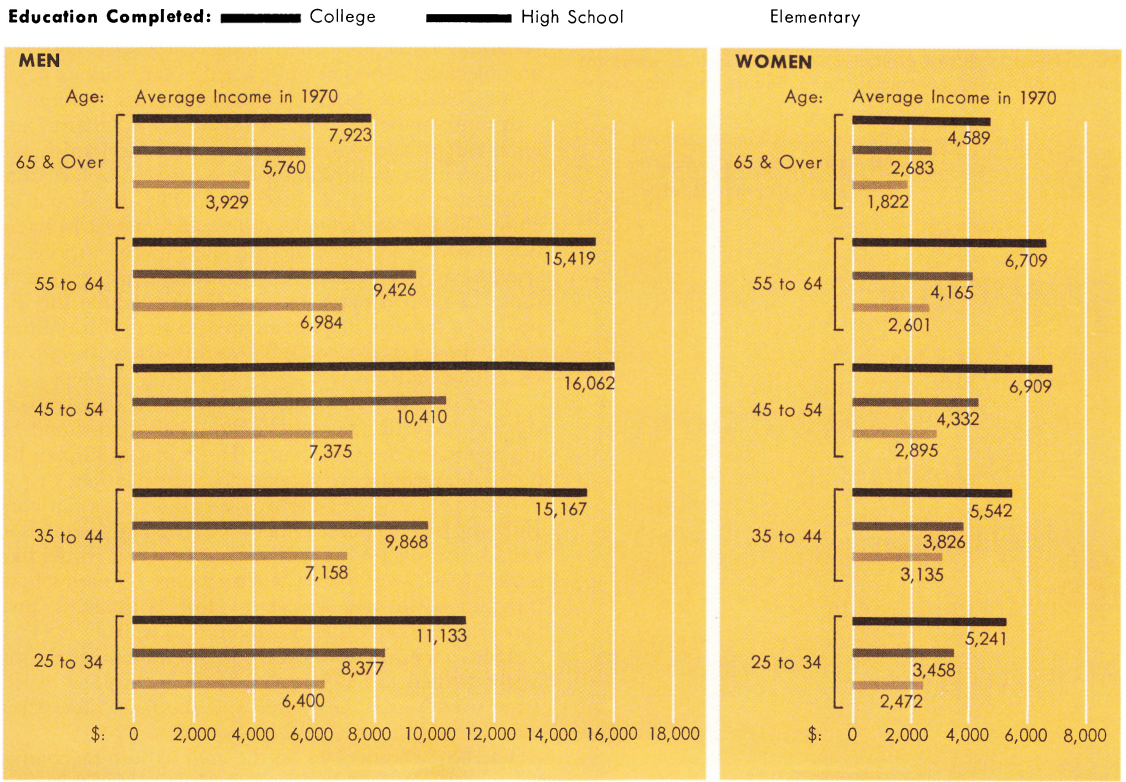
After a person is making more than enough to meet day-to-day expenses, earning a living can include enough to provide security for the future. Security involves keeping a job or being able to get an equally good one, as well as having enough money for illness or old age. Such earnings are called *continuing earnings*.

Most people have current earnings and long-term security in mind when they consider a vocation. Many are also concerned about status. When a person has a particular status, people expect certain things of him, and he expects certain things of others. For example, a doctor's status is generally considered high. He has completed a difficult and expensive education, he earns a sizable income, and he helps others. Because of the doctor's status, people expect him to cure illness and to have a high standard of living. He expects people to seek his help and to call him "doctor."

The demands and expectations of status can affect a person's life in ways that he may view as both good and bad. A young person getting started in the world of work may like earning a good salary and being treated like an adult. But he may not like to punch a time clock five days a week, or have a shorter summer vacation than he had as a student. A person who is established in a position may enjoy having people turn to him for

ANNUAL INCOME IN THE UNITED STATES BY AMOUNT OF EDUCATION

The advantage of education is shown in the incomes at each educational level. In most age groups, college graduates earn about twice as much as persons with only an elementary school education.



Source: U.S. Bureau of the Census

WORLD BOOK graph

advice. But he might complain about the many demands they make on his time.

The importance and power that status gives people may also be both good and bad. The desire to be respected and admired, and the ambition to rise to a responsible position, can be good for a person and for society. But some persons are too eager to be praised and to have power over others. They may sacrifice too much to gain status, and then abuse their power.

If a person has a position that provides the income, security, and status he desires, he usually has an opportunity for self-expression. He may, for example, create beautiful objects, solve difficult problems, invent new things, or aid less fortunate people. Most persons who are able to express themselves in their work find the work satisfying.

What Is Success? The definition of success varies from person to person. An individual might be considered successful by one person and unsuccessful by another. The most important judge of a person's success is the person himself. Other judges include his family, friends, neighbors, fellow workers, employer, and perhaps an expert such as a psychologist who has studied the person and his career.

Each person who judges success—his own or someone else's—may base his definition on one or more different values. One person might believe that an individual's salary is the basic factor. Another might feel that mastering a job and doing it well are more important. A third person might base his definition on whether the individual is making the best possible use of his abilities. Still another judge might consider the individual's happiness in his job to be the most vital factor.

Success is closely related to satisfaction. A man may be considered successful because he earns a good salary and is respected by his family, friends, and fellow workers. But he may be dissatisfied because he feels he should be receiving a higher salary. Another person may be regarded as unsuccessful because he does not seem to be making full use of his abilities. But he may be entirely satisfied with his accomplishments, and consider himself successful.

It is possible for a person to be satisfied with his vocation but dissatisfied with his particular job. A young engineer may be completely happy with his vocation of engineer, but unhappy with his job as a draftsman. If he moves up to a more responsible position, he may become satisfied with his job and remain satisfied with his vocation.

Making Vocational Decisions. In choosing a vocation and trying to achieve success, a person faces many decisions. There are two kinds of vocational decisions. Some decisions involve the selection of a future objective or goal. The objective may be a specific vocation, or an opportunity to try or to learn about various vocations. Vocational guidance counselors call these decisions *goal decisions*. Other decisions involve selecting the training and experience necessary to enter a vocation. These are called *means decisions*. In choosing an objective, a person must learn about various possibilities, evaluate them, and then make his decision.

A ninth-grade boy may be uncertain whether to aim for a career in engineering or in auto mechanics. His first step in deciding should be to list certain facts that are related to each of these fields. The list should include the boy's academic ability, his interest in scientific theory compared to the mechanical aspects of science, and his grades in mathematics compared to those in shop courses. It also should include the appeal of a repair garage compared to that of a drafting room, the kinds of people he would work with in both vocations, and the average incomes in both fields.

After studying the factors involved in each choice, the boy may decide that he would do better and be happier as an auto mechanic. He then should plan his high school courses to prepare for this vocation.

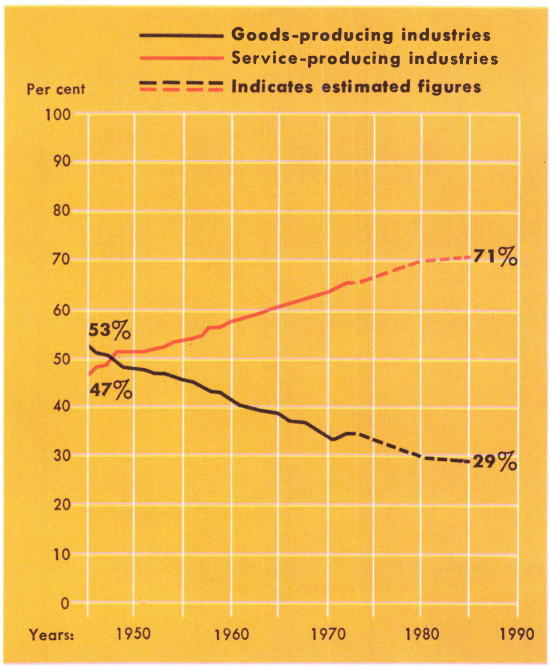
Perhaps a study of the two vocations may not convince the boy to choose either one. He could feel that he would like to earn an engineer's salary, but would like a mechanic's work better. He may plan his high school program so he can further explore both fields, and learn more about other possibilities as well.

After a person has chosen a vocational goal, the methods used to reach it should be determined in the same way. Various methods and the facts that affect them should be listed and evaluated.

The boy who decides on the goal of auto mechanic, for example, might list three methods of reaching his

WORKERS IN GOODS-PRODUCING AND SERVICE-PRODUCING INDUSTRIES

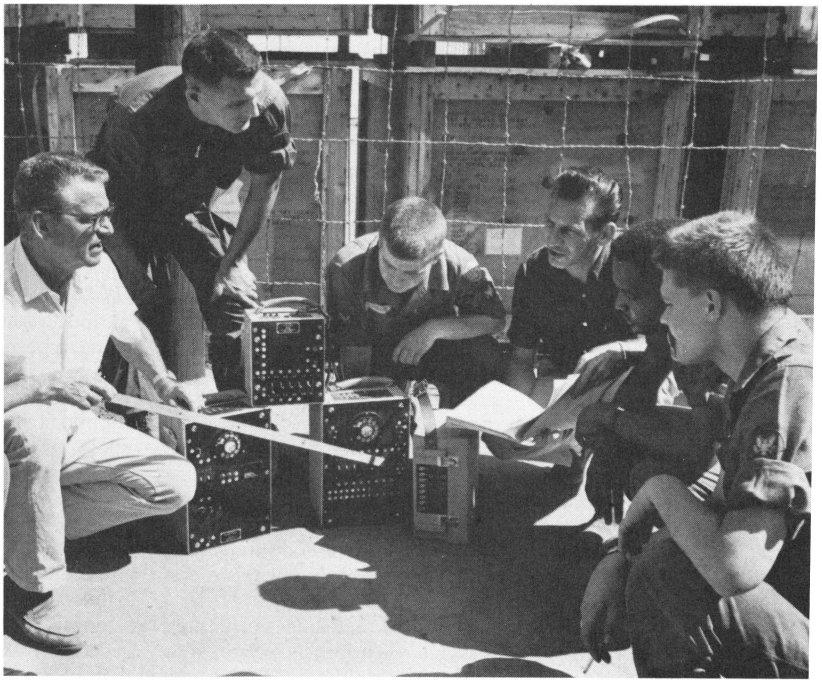
Since 1945, the demand for workers in goods-producing industries, such as manufacturing, agriculture, and mining, has declined. The demand in service-producing industries, such as wholesale and retail trade, government, and finance, has increased.



Source: U.S. Bureau of Labor Statistics WORLD BOOK graph

McDonnell Douglas Corporation

On-the-Job Training allows people to learn a skill and earn money at the same time.



Western Electric

The Armed Forces provide training and experience in many fields. Their training in technical areas is especially valuable in seeking civilian jobs.

goal. He could complete high school and then go to a technical institute for specialized training. Or he could go from junior high school to trade school and then to a job. Or he could leave school as soon as legally possible, get a job as a mechanic's helper, and someday perhaps take night school courses. The boy should consider the short-term and long-term cost of each method, the probability of getting a job, and the chances for advancement.

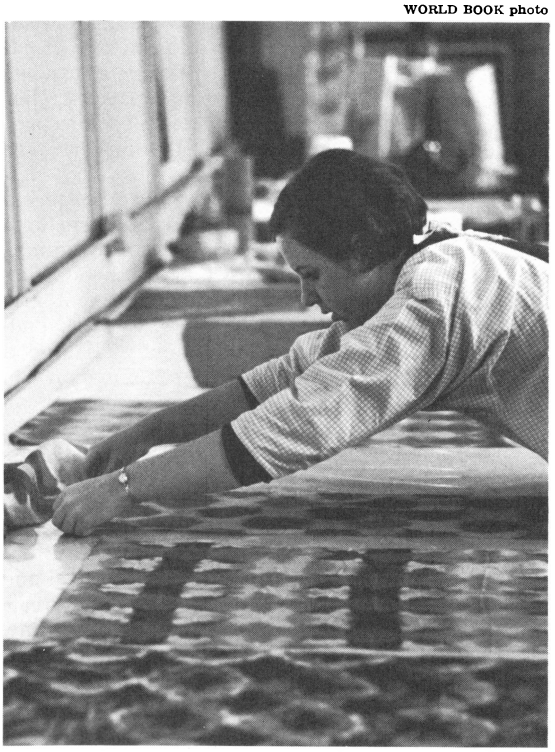
If he decides to further explore vocational possibilities, he could take college preparatory courses with emphasis on science, or industrial arts courses. Or he could transfer to a trade and technical high school and take courses that would be helpful for either engineering school or an auto mechanic's job.

Factors in Vocational Development. Many factors affect entering and succeeding in a vocation. One of the most important is *aptitude*, the ability to learn quickly and easily. Of the several types of aptitudes, intelligence, or *general aptitude*, affects nearly everything a person does. The more intelligent a person is, the more likely he is to succeed in a demanding vocation.

General aptitude can be broken down into three special aptitudes. The ability to think with words is called *verbal aptitude*. The ability to think with such numerical symbols as those used in algebra, physics, and engineering is called *numerical aptitude*. The ability to judge shapes, sizes, and distances when word and number symbols are not used is called *spatial aptitude*. Other specialized aptitudes involve various physical skills, such as those necessary for assembling delicate electronic

Many Types of Schools teach specialized vocational skills. This girl is learning fabric design in an art school.

WORLD BOOK photo



equipment, or quickly packing and wrapping objects.

Aptitudes result from a combination of natural ability and experience. They develop when used, and decline if not used.

Another important factor in vocational development is past achievement. A person's previous accomplishments play a large role in determining his future success. These achievements are reflected in school grades, student activities, recommendations from friends and acquaintances, hobbies and other leisure-time interests, and employment records. Differences in achievement in different types of activity give clues to a person's aptitudes, interests, and desires.

A person's interests are also a factor in his choice of a vocation. They can help determine his satisfaction and, sometimes, his success in his work. People's interests vary greatly. Some persons like contact with other persons. Others like to work alone. Some enjoy working with numbers or solving problems. Others prefer artistic or literary pursuits. Interests usually become evident in a person's choice of school courses and hobbies. But interests are not always a good indication of success, because people can do well in vocations that do not interest them.

Interests are closely related to preferences or desires, another factor in choosing a vocation. A person may have an idea of what he would like to do without understanding exactly what his interests are. He may be influenced by family traditions, a desire for prestige, or the ideas of classmates. A person's preferences are a summary of what he knows about himself and of what he considers important and unimportant.

Many people believe that personality is an important factor in a vocation, and that some personalities fit better into some vocations than into others. For example, salesmen are usually thought to be aggressive, bookkeepers quiet, and ministers sympathetic. But there are many quiet salesmen, aggressive bookkeepers, and unsympathetic ministers. Most vocations have room for most types of personalities.

A person's economic and social status also play a part in his vocational decisions and success. Sometimes these factors provide what seem to be unfair advantages or disadvantages. One of the functions of schools, community agencies, youth groups, and employment services is to help everyone obtain as many vocational advantages as possible. A person whose family has no good books or magazines with vocational information can find them in a school or public library. A teen-ager can meet adults whose work is different from his father's through a number of youth organizations. Students who need money to complete their education can get scholarships or loans through various agencies.

An individual has control over many factors that affect his vocational decisions and development. But there are others he cannot control. Various social and economic factors can eliminate some jobs and create others. An industry may close down or move away, leaving hundreds of persons without work. On the other hand, business firms and government programs provide jobs for many people who had seemed hopelessly unemployed.

Many persons choose a vocation and stay in it most of their lives. A machinist may work at his trade from the day he becomes an apprentice until he retires. He makes a career of his vocation. Many other people change vocations a number of times during their careers. They may or may not finally settle in one vocation. A truck driver, for example, may become a salesman, then a television repairman, and end up establishing his own TV maintenance company.

Career Patterns. Persons who remain in one vocation for most of their lives have what are called *vocationally stable careers*. A person with such a career may hold various positions, but they all involve basically the same type of work. A physician might start his own practice, take a position with a hospital, or teach in a medical school. A machinist might work in an automobile factory, an instrument plant, or a small machine shop.

A person can also achieve career stability by holding different kinds of jobs, but remaining in the same company or type of company. This type of career is called an *industrially stable career*. In most cases, a person with an industrially stable career begins work in what is called an *entry job*. He may have had some previous training in school or college for the job, or he may receive on-the-job training. After a period in the entry job, he may transfer or be promoted to another job. A number of such moves may be made as he works his way up in a company or switches from one company to another. A man might start as an assembly line worker, get promoted to inspector, move up to assistant foreman, and finally become shop foreman. Similar cases occur frequently in office work, where knowledge gained in early jobs helps men and women move up to executive positions.

Most people with stable careers have completed some type of specialized education in college or trade school. Or they have entered an established business in which they have some family or financial interest. They find it difficult to give up their vocation, even if they do not like the work. Their skills are usually in demand, and they have invested a great deal of time, work, and money in their vocation.

If a person has no special vocational training, or is not sure what vocation to enter, he probably will follow a *conventional career*. Through the years, he will move from one type of work to another in different vocations. For example, a man who took college preparatory courses in high school may go to work as a stock clerk instead of continuing his education. Later, he may become a bookkeeper's assistant, then a cashier, and then a hotel clerk.

If a person has enough ability and ambition, he probably can work his way into increasingly more responsible positions as he changes jobs and vocations. He may finally settle in one vocation and begin pursuing a stable career.

Conventional career patterns are most typical for men and women who have had a general education in high school or college. When entering the labor market, their only qualifications are general aptitude and willingness to work. However, many employers look for

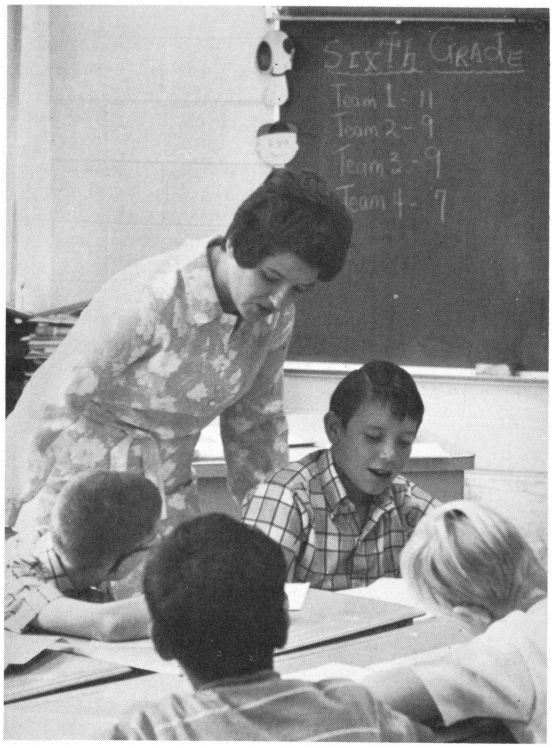
such young people who learn quickly and can be trained easily.

Sometimes a person who seems to have a good future in a vocation has his progress upset. His company may go bankrupt. A technical change could eliminate his type of work. He might become ill or disabled. He may become dissatisfied and quit, or he may be fired. Following each disruption, the person may have to take a less responsible position, or even turn to a different vocation. The result may be an *unstable career*.

Unstable careers occur most frequently among persons who are just beginning a job, whose specialized training is limited, or whose skills are most easily replaced. An engineer probably will keep his job after his company reduces production. He holds a key position or is needed to help increase production again. An assembly worker, on the other hand, may be laid off after the production cut because he can easily be replaced later.

Many young people who begin their careers with a series of unrelated jobs are forced into what are called *multiple-trial careers*. In moving from job to job, they do not acquire valuable knowledge or skill in any particular area. They are useful only in semi-skilled or unskilled jobs that require little training or experience. As a result, they have difficulty becoming established in a vocation. Most of them have dropped out of high school before graduation, or graduated without the skills needed in business and industry.

A stable career for a woman may involve either a vocation or marriage. If a woman is both a homemaker and a wage earner, she pursues what is called a *double-*



Some Women Have Two Vocations and pursue a *double-track career*. This woman, like many other teachers, combines her days in the classroom with the responsibilities of homemaking.
WORLD BOOK photos

WORLD BOOK photo

Students Learn About Vocations through special programs sponsored by schools. Members of various professions explain the requirements for and the opportunities in their fields.

track career. This pattern is most common among highly educated women with interest in a vocation, and those with much less education who want to increase their family income. Conventional careers for women involve holding a series of jobs before becoming a homemaker. Conventional careers become *interrupted careers* if the woman works until she marries, gives up work while her children are young, and returns after they are older.

The Stages of a Career correspond to the stages of a person's life. They are not sharply separated, and some activities that seem typical of one stage are also found in others.

A person lays the foundation of his career during childhood. During this stage, his physical, intellectual, and emotional development is more rapid than at any other time. The child forms ideas about the kind of person he is, and the kind of adult he would like to become. He develops interests and abilities that will influence his future vocation.

During adolescence, an exploratory stage begins. Most teen-agers sample various vocational possibilities. A boy may try being a carpenter in the school woodshop and a mathematician in algebra class. At the same time, he might be a writer on the school paper and a business executive organizing a class dance. A teen-ager's thinking is influenced by his family, friends, and school—and his desire to be grown up and have money of his own. The attitudes and interests of his family may help him use his abilities and interests. Or these attitudes and interests may make it difficult for him to pursue some of the opportunities available to him. His friends and his school can have similar good and bad effects. Most schools try to help students by providing vocational information and training.

With many persons, the exploration process continues into college and the first few years of work. The first two years of college may be exploratory for a student who has not selected a major field of study. For some, all four years of college can be exploratory. They plan to attend graduate school in a field selected after trying out a major, a minor, and some elective subjects. The first few job changes are exploratory for most people with conventional careers. Even a person in a stable career may spend a few years learning where he fits best in his vocation.

After a person reaches his middle 20's and has been pursuing a stable or conventional career for several years, he probably has become established in his work. He has found a vocation that he likes and in which he can do at least reasonably well. He also has started to advance to better positions that provide enough money for his needs.

The process of establishment and advancement in a vocation continues for a number of years. By the time a person reaches his 40's, the process of advancing to new positions has probably slowed down or stopped. After the age of 45, most people keep doing the same work they have done before. This stage continues until approaching retirement, or retirement itself, causes a slowing down of activity.

Exploring Vocations. Of all the stages in a career, the exploratory stage is probably the most important.

Most people do not consciously stop to explore themselves and the vocational possibilities open to them. But carefully planned exploration can help a person understand his abilities and interests, and provide information on educational and vocational opportunities. Careful exploration is likely to produce the best possible vocational decisions.

A student in high school or college chooses certain courses for one or more reasons. Perhaps he wants to meet the requirements of a specific program, or to enter another school or college. He may want to learn important skills, or simply to get what experts consider a good education.

The emphasis in education is on preparation for something. But schools also offer an excellent opportunity for exploration. Some junior high schools, for example, offer various language courses to help students decide which language they want to study in high school. Nearly all high school courses and student activities can be both exploratory and preparatory. College preparatory programs in high schools are designed to let students sample many subjects before entering college.

Most colleges require freshmen and sophomores to take courses in a variety of subjects. The students get a chance to become familiar with fields they might otherwise not have considered.

After exploring various courses, many college students change their majors. A large number of boys switch from engineering to some other major during their first year of college. In most cases, they did not explore the field of engineering well enough to have a clear idea of what it involved. They did not understand that being good at high school algebra and at working on old cars is not engineering.

Exploration of any field involves trying to gain experiences that will reveal all aspects of the work. In engineering, it could include reading about the subject, talking with engineers on the job, or getting a summer position with an engineering firm.

One boy in junior high school was sure he wanted to be an engineer. His hobbies included working with model planes, engines, and railroads. He received outstanding grades in every school subject. He liked math and produced excellent science projects. His art teacher urged him to take some art courses in high school because he had done well in art. But the student considered art a girl's subject. He visited two engineering schools, an atomic energy plant, and a dam and hydroelectric plant. After these trips, he talked most about the design of a modern building at one school and the plan of the campus at the other school. He was encouraged to visit more places of architectural interest, and got an opportunity to discuss what he saw. At the end of eleventh grade, the student announced that he would rather be an architect than an engineer. He felt that architecture would give him more opportunity to use his abilities and express his interests. He majored in fine arts in college, and chose electives in mathematics, physics, and history. Then he did graduate work in architecture. A few years later, he became a specialist in city planning.

When a person sets out to find a job, he becomes a salesman. He must sell himself and his ability to an employer. To do this, he must know (1) what he has that would be useful to an employer, (2) why an employer might be able to use his knowledge and skills, and (3) how to show an employer what he has to offer.

Knowing Oneself. The best way for a person to determine his knowledge, abilities, and interests is to review what he has done in the past. His past activities can tell something of what he will do in the future. A person who has learned to do a variety of new things is likely to continue doing so. One who has stayed with a single activity may have difficulty learning new things, and probably will continue that activity.

A review of past activities should include school work, student activities, community organization activities, and part-time or full-time jobs. The knowledge and skills used in any of these areas might be useful in getting a good position.

Accomplishments in school work and student activities are especially good indications of skills. Grades in English and mathematics show how well a person has developed skills that are basic to nearly all kinds of work. Accomplishments in shop and laboratory courses indicate manual and mechanical skills that are used in factories, shops, and clinics. Social skills in such activities as student government or a school publication are important in sales work, supervisory jobs, and managerial positions.

One way to organize a review of past experience is to prepare a résumé, an outline of past accomplishments that can be given to potential employers. Filling out employment application blanks also helps a person find out what employers want to know about applicants. Information on how to prepare a résumé and fill out application blanks is given later in this article.

Finding Opportunities. After a person has gained thorough knowledge of himself, he can select the kind of work he would like to do. Then he must find out what opportunities are available. This information is usually obtained in one of four ways: (1) by talking with other people, (2) by reading newspaper advertisements and articles, (3) by studying classified telephone directories and trade publications to get the names of employers, or (4) by consulting school and employment service counselors.

Much information on job opportunities can be found by talking with friends or acquaintances. A worker in an automobile plant may tell his friends that his company is hiring assemblers. His friends may then tell their friends, and, as the information spreads, someone who is looking for a job as an assembler may find a good opportunity. Young people about to finish high school or college often talk to older persons about job opportunities. Persons with experience in the world of work can usually provide information and can sometimes make contacts for a job hunter.

Employment advertisements in newspapers describe available jobs and provide information on how and where to apply for them. Articles in business sections of newspapers and magazines tell what employment possibilities certain companies might offer.

Studying classified telephone directories and trade publications can be useful for learning what companies offer jobs in a particular field. Specific employment information is not always found in these sources.

School counselors and placement services, state employment services, and private employment agencies usually offer opportunities for job seekers. They may provide job counseling service, detailed information about specific jobs, and, when appropriate, interviews or other direct contact with possible employers.

Information obtained from these various sources may lead directly to a good job and a stable career. Or a person seeking employment can use this information to make a list of companies to write or visit. The list should give each firm's name, address, and telephone number; the name of the person in charge of hiring; the kinds of jobs that are available; how to contact the firm; dates when any contacts were made; and any additional information that might be helpful.

Making Contacts. After selecting a type of work and finding out what opportunities are available, the job hunter must contact employers and present his qualifications. Contacts can be made by letter or interview, or by filling out an application blank. The method used usually depends on the kind of job being sought.

Most lower level jobs can be obtained by simply filling out an application blank at a company employment office. Persons seeking these jobs usually apply in person rather than by mail. Higher level jobs may be applied for by mail or in person. Applicants for most of these jobs are required to come in for an interview.

Filling Out Application Blanks. If an employer has, or expects to have, an opening, he will usually ask the applicant to fill out an application blank. A blank may be short and require little information, or it may be a detailed questionnaire.

Application blanks are designed to provide important facts about an applicant. Most of them ask for information on the applicant's education, student activities, previous employment, skills and interests, military experience, marital status, and general health.

In filling out an employment application blank, a person creates a picture of himself. He should read each question carefully before answering it. The questions should be answered as briefly, clearly, and neatly as possible. It is helpful to become familiar with various types of application blanks, and to organize the information usually asked for. Then a blank can be filled out quickly and easily in an employment office.

Writing a Résumé. A résumé, like an application blank, provides a brief summary of a person's background and experience. It is useful to leave with an employer, or to mail with a letter of inquiry about job openings.

A résumé can influence an employer's impression of an applicant, and should be carefully prepared. It should be simple, direct, well organized, and easy to read. An employer should be able to see quickly whether an applicant might be qualified for a position. The résumé also should tell the employer whether it would be worthwhile to get more information.

The applicant's name, address, and telephone number should be at the top of his résumé. Following this should come a brief statement explaining the type of job he is seeking. If the applicant has any experience or training in the job, this statement will tell the employer how well the person knows his area. The final part of the résumé should include information on the applicant's education, previous employment, special experience, and related hobbies.

PERSONAL AND CONFIDENTIAL RÉSUMÉ

John Doe
8848 South Blackstone Avenue
Chicago, Illinois 60649
TU 8-6479

TYPE OF POSITION SOUGHT:

Research Assistant

EXPERIENCE:

7/65 to 11/68

Headstart Research and Evaluation Center, University of Chicago, 5801 South Kenwood Avenue, Chicago, Illinois

2/68 to 11/68

Tested, interviewed Headstart children and parents for Evaluation study

7/65 to 2/68

Research on testing methods

9/61 to 6/65

Illinois Masonic Hospital School of Nursing, 2650 Ridge, Chicago, Illinois - Psychology Instructor

EDUCATION:

Southern Illinois University, Carbondale, Illinois 1957-61
Major: Psychology, Bachelor of Arts degree

Northeastern State College, Chicago, Illinois 1966-68
Major: Clinical Psychology, Master of Arts degree

HONORS: University Fellow (Southern Illinois University), 1957-61

OUTSIDE ACTIVITIES:

Community meetings for civic improvement, aide to charitable organizations, swimming, golf, tennis, Member of American Psychological Association

FOREIGN LANGUAGES READ OR SPOKEN: Spanish, German

PERSONAL DATA:

Birthdate: June 19, 1938 Weight: 155 lbs.
Place of birth: Chicago, Illinois Marital Status: Single
Height: 5'6" Citizenship: U.S. Citizen

SALARY: Open

REFERENCES: References and unofficial record of courses and grades will be furnished upon request

A Résumé is a brief biography of a person seeking a position. It should be well organized and easy for an employer to read.

Generally, résumés are used only by persons seeking fairly high level jobs. When mailed to an employer, they should be accompanied by a letter asking for information about job openings. The letter should be short and should supplement, rather than repeat, the information in the résumé. The letter is important because it can express the applicant's personality better than a résumé can.

Being Interviewed. An employer who is favorably impressed by the information in an application blank or résumé may ask the applicant to come in for an interview. The purpose of an interview is nearly always the same. For the applicant, the purpose is to tell about himself, to find out more about the company and job, and to decide whether he wants the job. For the employer, it

is to find out more about the applicant, to tell the applicant about the company and the job, and to decide whether the company wants the applicant.

There are almost as many kinds of employment interviews as there are interviewers. Some employers ask only general questions. They are more interested in what an applicant has to say—and how he says it—than in getting specific answers to questions already covered by the application blank. Other interviewers talk a lot about the company, and even about themselves. They may give the applicant little opportunity to talk. Applicants sometimes have a chance to ask questions of the interviewer. It is helpful to have a few thoughtful questions in mind, because an employer may be interested in the kinds of questions asked.

An applicant can greatly influence an interviewer by his manner and dress. Other important factors include how the applicant enters the room, greets the interviewer, sits down, responds to questions, gets ready to leave, and thanks the interviewer.

Deciding on a Job. After surveying job possibilities, filling out application blanks, and being interviewed, a job hunter may have more than one offer from which to choose. In making a decision, it helps to list the advantages and disadvantages of each job, and to decide which factors are most important. The type of work involved—and where, when, with whom, and for what rewards it is done—all must be considered.

The rewards offered by a job consist not only of hourly pay or annual earnings, but also of *fringe benefits*. These include insurance programs, retirement plans, vacations, and job security. The rewards can also involve opportunities for advancement, and chances to do interesting and important things.

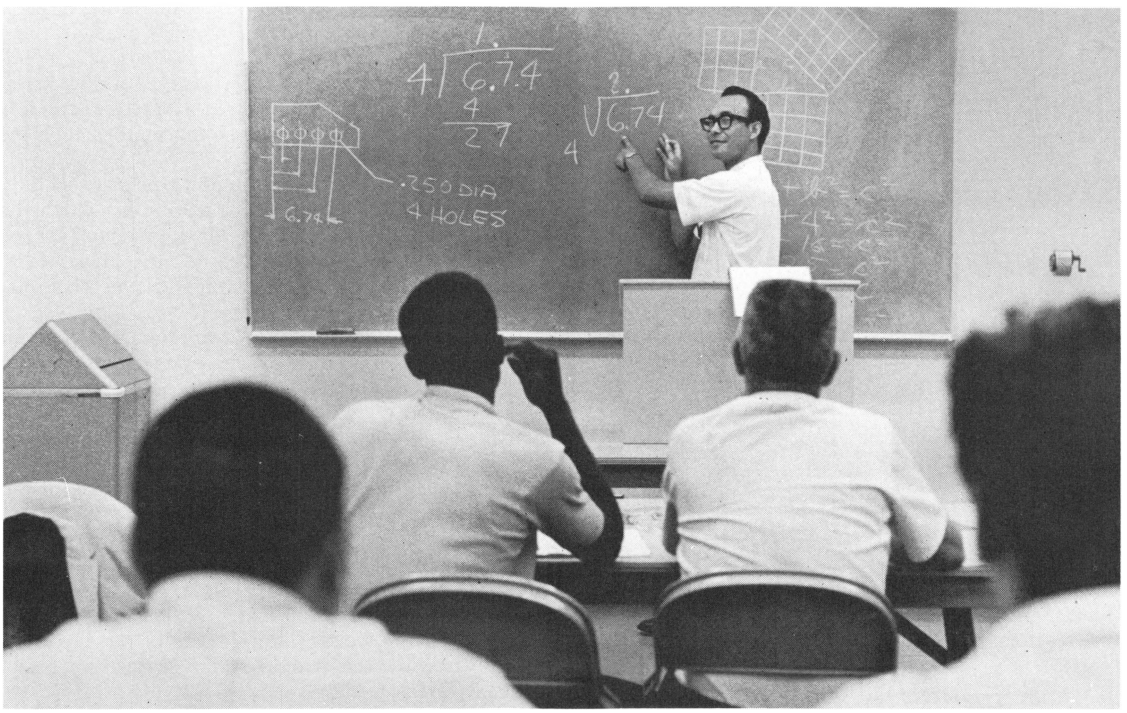
Some jobs must be considered in terms of what they offer over a period of years, rather than what they offer immediately. A job that offers good starting pay and can be learned quickly may not provide many opportunities for salary increases or promotion. Or a job with a low starting salary may offer good chances for quick raises and promotion. Many people take jobs with high starting pay. After a few years, they wish they had investigated the job more carefully or had spent more time in school or training.

Adjusting to a Job. After getting what seems to be a good job, a person must adjust to the demands of the employer and the position. Otherwise, he will not be able to hold the job and advance in it. One of the main reasons people leave jobs is because they cannot—or are not willing to—get along with supervisors, fellow workers, and rules and regulations.

Holding a job is entirely different from going to school. Schools exist for their students, but companies do not exist for their employees. Workers are employed to meet the needs of companies. Failing a course in school may simply mean repeating the course. A student with a poor school record may be able to get a good job. But failing in a job means losing the job. And a poor employment record usually means a poor job or no job at all—now and in the future.

Special Training Programs are offered by some companies to help people who otherwise would not be able to qualify for employment. These programs teach both basic and specific skills.

Don Dornan



There are thousands of individuals, organizations, and publications devoted to finding and giving vocational information. Computers and other automated equipment are used to store the information and to make it available quickly.

Counselors. People who provide help in choosing an occupation, planning a career, or solving vocational problems are called vocational counselors. They work in high schools, community agencies, religious centers, state employment services, college counseling and placement centers, and hospitals. Their services are available, generally, at no charge, to the students, clients, or patients in their institutions, and to the public. Some private counseling agencies offer services for a fee. The American Personnel and Guidance Association publishes a *Directory of Approved Counseling Agencies* that lists places where counseling service is available. The address of the association is 1607 New Hampshire Avenue NW, Washington, D.C. 20009.

Vocational Counselors try to help job seekers make important vocational decisions. These experts use interviews to give a person the necessary information and guidance.

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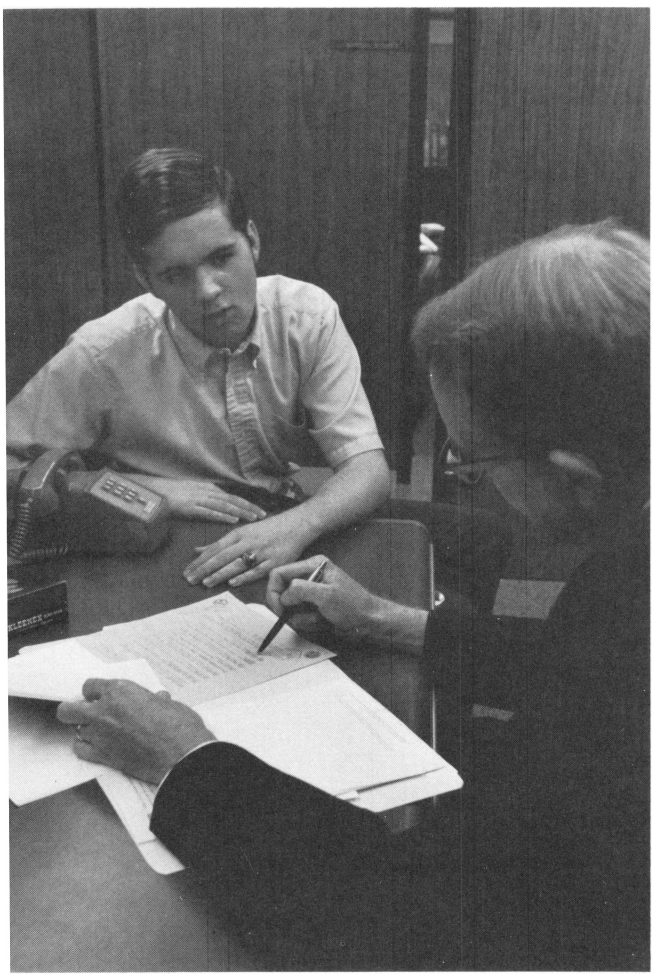

Counseling is generally done through interviews or discussions, either individually or in groups. Counselors usually supplement these discussions with testing and study of the person's background and experience. A counselor does not tell a person what he should do. The counselor helps the person (1) know what facts should be considered, (2) obtain and understand necessary information, and (3) use the facts and information to make the best possible choice.

Parents, teachers, and friends may offer advice and support, or give information that can help a person seeking a vocation. But these people lack the training of a professional counselor. They also could have strong personal opinions about what the person should do, and could keep him from making the best possible decision.

Books and Pamphlets. Many books and pamphlets provide detailed information on vocations. Some are published by business organizations or government agencies. Vocational publications are listed and evaluated in the *Vocational Guidance Quarterly*, published by the American Personnel and Guidance Association. Many such publications are available in school and public libraries.

The United States Department of Labor is one of the best sources of vocational materials. It publishes the *Dictionary of Occupational Titles*, which describes more than 20,000 occupations. Using code numbers for each occupation, this dictionary classifies jobs according to title, duties, requirements, and other factors. The dictionary may seem complicated, but a counselor or librarian can usually show a job seeker how to use it effectively.

The *Occupational Outlook Handbook*, also published by the Department of Labor, gives interesting descriptions of over 500 common vocations. It classifies them according to various vocational categories. The handbook has information on requirements, working conditions, and earnings for each job. It also tells of employment trends, and predicts the opportunities that the job will offer in the future.

When looking for job information, a person generally wants to know (1) the name, or names, by which the job is known; (2) the work activities involved; (3) the training and education required; (4) the physical demands and working conditions; and (5) the job's relation to possible future positions.

A job may be classified under a number of different names. For example, a man who operates a generator may be called a stationary engineer, an operating engineer, a power plant operator, or a stationary-engine man. It is important to know the correct names for a job before looking for information about it. The *Dictionary of Occupational Titles* is the best source of job names.

The physical demands and working conditions of a job are important factors in a person's success and satisfaction. Physical demands include walking, lifting, standing, stooping, and talking. Working conditions tell whether the work is done inside or outside, individually or with other people, and in dirty, dusty, noisy, or smelly areas.

A person seeking job information in the United States can choose from the more than 20,000 occupations listed under about 40,000 titles in the *Dictionary of Occupational Titles*. There are so many occupations, that thousands of facts must be organized so a job hunter can easily obtain the information he wants. This article divides occupations into general groups according to *field* and *level*.

Occupations are usually thought of in terms of fields, or the types of activity they involve. Fields are determined by what people in them do and what they work with. There are eight main vocational fields: (1) service, (2) business contact, (3) business organization, (4) technology, (5) science, (6) outdoor, (7) general culture, and (8) arts and entertainment. Each of these fields includes thousands of occupations. The technology field, for example, includes occupations that are involved in the production, maintenance, and transportation of nearly all the products people use. A number of occupations may be classified in two or more fields because they involve various basic activities. Architecture can be listed under both technology and the arts because it requires knowledge of engineering principles and artistic ability.

Occupations are classified at various levels according to the amount of education needed, the skill or knowledge required, and the amount of responsibility involved. Each field has its own series of levels. Typical levels in the business organization field are the professional and managerial, most of which require a college degree; the clerical, which require a business school or high school diploma; and the unskilled, with no educational requirements.

Levels in all eight fields are identified by standard names that indicate the education and training required. There are four chief levels: (1) university, (2) specialty, (3) long on-the-job training, and (4) short on-the-job training. University level jobs are those for which it is essential, or at least desirable, to go to college and perhaps to graduate school. Most specialty level occupations require a high school diploma and some specialized education or training after high school. Long on-the-job-training occupations require knowledge that can be obtained through special training programs, by working in a related occupation, or by observing and working on the job. A high school education is required for some jobs on this level. In short on-the-job-training occupations, a person can learn what he needs to know when he starts the job. Many of these jobs have no educational requirements.

Service Vocations

Service occupations are those in which people try to understand and meet the needs of others. They involve a wide range of occupations that can be classified as social service, protective service, or personal service. People in social service occupations include psychologists, social workers, and counselors. Policemen, firemen, and FBI agents have protective service jobs. People in personal service vocations include barbers, waiters, and taxi drivers.

Such occupations as social worker and waiter do not appear to belong in the same vocational field. But both occupations basically involve understanding what a person wants and needs, and seeing that he gets it. A high level service occupation, such as that of social worker, is concerned with meeting people's emotional, intellectual, and social needs. A lower level service occupation, such as that of waiter, is concerned with meeting physical needs.

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Service Station Attendants are trained on the job. One of their many responsibilities is to provide directions for motorists.

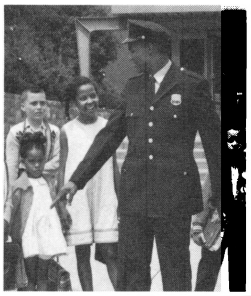
Some occupations that might also fit in other fields are classified as service vocations. Psychiatrists, who devote most of their time to helping people with emotional problems, are trained as physicians before specializing in psychiatry. Their basic occupation would put them in the science field, but their specialty places them in the service field. Nurses also could be classified in the science field because of their medical training. But because nurses are usually more interested in the people they care for than in the illness being treated, they are considered service personnel.

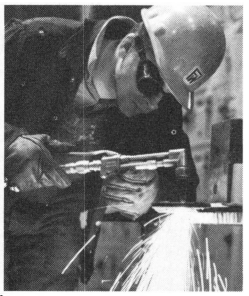
University Level. Social service occupations on the university level include those of psychiatrist, psychologist, social worker, counselor, and occupational therapist. These occupations involve studying people and working with them in an effort to help them lead happy, productive lives.

Protective service workers on the university level include parole officers and FBI agents. Parole officers are combination social and protective service workers. FBI agents aim more at protecting the public than at helping individuals in trouble.

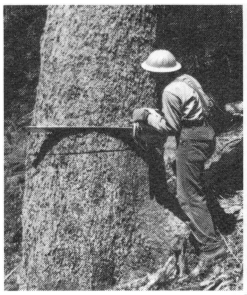
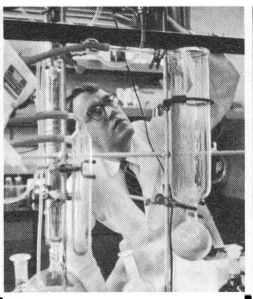
Specialty Level. Social service jobs on this level include those of recreation worker, welfare worker, and employment interviewer. Some of the jobs involve such group work as directing recreational programs in parks, playgrounds, and youth centers. Others involve case

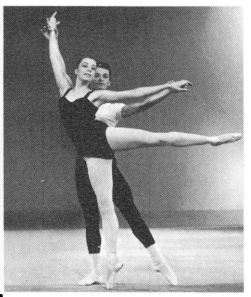
FIELDS AND LEVELS OF OCCUPATIONS





	SERVICE	BUSINESS CONTACT	BUSINESS ORGANIZATION	TECHNOLOGY
UNIVERSITY LEVEL	FBI Agent Occupational Therapist Parole Officer Psychiatrist Psychologist Rehabilitation Counselor School Counselor Social Worker Speech Pathologist Vocational Counselor Welfare Worker	Manufacturer's Salesman Public Relations Worker Securities Salesman	Accountant Actuary Advertising Worker Controller Division Director Economist Hospital Administrator Hotel Manager Market Researcher Personnel Manager Purchasing Agent	Airline Pilot Chemical Engineer Civil Engineer Electrical Engineer Industrial Chemist Mechanical Engineer Mining Engineer Technical Writer
SPECIALTY LEVEL	Detective Employment Interviewer Fire Captain Funeral Director Hotel Housekeeper Police Officer Recreation Worker Welfare Worker	Automobile Salesman Insurance Agent Manufacturer's Salesman Real Estate Salesman Wholesale Salesman	Bank Teller Bookkeeper Clerk-Typist General Office Clerk Hotel Housekeeper Payroll Clerk Programmer Secretary Ticket Agent	Appliance Serviceman Auto Mechanic Baker Butcher Carpenter Dental Technologist Draftsman Electrician Engraver Machinist Plumber Television Serviceman
LONG ON-THE-JOB TRAINING	Barber Beautician Cook Fireman Policeman Service Station Attendant Taxi Driver	Retail Sales Clerk (major items)	Bookkeeping Clerk General Office Clerk Keypunch Operator Office Machine Operator Shipping Clerk Telephone Operator	Bus Driver Boiler Operator Cement Mason Factory Inspector Factory Machine Operator House Painter Service Station Attendant Truck Driver Welder
SHORT ON-THE-JOB TRAINING	Cook's Helper Hospital Orderly Hotel Bellman Household Worker Janitor Nurse's Aide	House-to-House Salesman Retail Sales Clerk (minor items)	Duplicating Machine Operator File Clerk Mail Carrier Mail Sorter	Auto Polisher Baker's Helper Factory Laborer Farm Laborer



OUTDOOR	SCIENCE	GENERAL CULTURE	ARTS AND ENTERTAINMENT	
Chief Surveyor Farm Manager Forester Landscape Architect Petroleum Engineer Range Manager Soil Scientist	Biologist Cartographer Chemist Dentist Dietician Geologist Mathematician Optometrist Pharmacist Physician Physicist Psychologist Statistician	Anthropologist Clergyman Historian Journalist Lawyer Librarian Political Scientist Psychologist Sociologist Teacher Urban Planner	Actor Architect Art Director Author Classical Musician Commercial Artist Composer Industrial Designer Music Teacher Painter Playwright	**UNIVERSITY LEVEL**
Farmer Forestry Technician Surveyor	Dental Hygienist Dental Technician Dental Technologist Medical Technologist Optician Soil Conservationist Soil Scientist X-ray Technician	Legal Secretary Newspaper Reporter Radio-Television Announcer Shorthand Reporter Translator	Advertising Layout Artist Advertising Copywriter Fashion Designer Instrumental Musician Interior Decorator Photographer Singer	**SPECIALTY LEVEL**
Farmer Miner Oil Well Pumper Survey Rodman		Ballroom Dancing Teacher Library Assistant Proofreader	Florist Instrumental Musician Letterer Paste-up Man Singer	**LONG ON-THE-JOB TRAINING**
Farm Worker Lumber Mill Laborer Nursery Laborer Oil Well Laborer	Hospital Attendant Hospital Orderly	Library Page	Motion-Picture Projectionist Pinboy	**SHORT ON-THE-JOB TRAINING**

David Glenn Hoffman, Artstreet

Public Service Workers include firemen and policemen, who have the responsibility of protecting both lives and property.

work, which includes helping people on welfare with financial, child care, homemaking, and various other problems.

Protective service occupations in the specialty group include high level police and fire department jobs. People prepare for these positions with study and experience on the job and in special programs. Most police and fire departments provide in-service training to help workers qualify for advancement.

Among the personal service workers at the specialty level are hotel housekeepers and funeral directors. Most of these people get their training through a combination of two- to four-year courses in special colleges and on-the-job training.

Long On-the-Job Training. Most of these jobs are in the protective service or personal service areas. They are held by policemen and firemen, who receive their training both in special schools and on the job; by barbers and beauticians, who are trained in schools; and by taxi drivers and service station attendants, who are trained on the job.

Short On-the-Job Training. Persons holding jobs in this group include nurse's aides, hospital orderlies, bellmen, and household or domestic workers. Some of their work involves personal contact. But much of what they do involves such activities as cleaning, serving food, carrying things, or otherwise providing comfort for others. These jobs are sometimes called unskilled or semi-skilled, but many of them require much skill.

Business Contact Vocations

Occupations in the business contact field involve dealing with people for the purpose of selling, promoting, or demonstrating goods or services. Automobile salesmen, public relations specialists, and department store clerks are all in this field.

University Level. Most salesmen on this level represent companies with complex products or services. Such salesmen must have a thorough knowledge of both their product and the people who are likely to buy it. Public relations experts try to create favorable public opinion for businesses, institutions, or individuals.

Specialty Level. Real estate, insurance, and automobile salesmen are grouped on this level, along with people who sell thousands of lesser known products. Many of the items they handle are sold wholesale or are sold only to special buyers. These products include drugs, plumbing supplies, textiles, and construction equipment. There is an almost unlimited number of occupations at the specialty level in the business contact field.

Long On-the-Job Training. Salesmen at this level need some special knowledge of their product and of consumer needs and desires. Some jobs on the specialty level can also be listed here if they do not require college or special training.

Typical long on-the-job training occupations in the business contact field are those that involve selling such retail items as clothing, furniture, appliances, hardware, and flowers. Most salespeople on this level earn more than other retail clerks.

Short On-the-Job Training. These business contact occupations involve chiefly over-the-counter and house-to-house retail selling. Retail clerks at this level can be trained quickly on the job. Their main responsibility is to sell merchandise that a customer requests and already knows about. Many house-to-house salesmen also receive only brief training. They often rely greatly on

Real Estate Salesmen, and most other sales personnel, must be familiar with both their product and their customers.

WORLD BOOK photo

their manner, appearance, and ability to speak well and intelligently.

In addition to full-time jobs, this level has many openings for part-time workers, as well as temporary workers during peak selling periods. Some workers eventually become sales managers or store managers.

Business Organization Vocations

People in business organization jobs are involved in all phases of business, industrial, and government administration. The growing size and importance of business and government are creating more jobs and a greater demand for leadership ability in the business organization field. Workers in this field range from top executives to file clerks.

An important factor in the business organization field has been the development of computers and other automated equipment. The wide use of electronic business machines has produced openings at nearly all levels for persons trained to operate them. It also has eliminated some jobs at lower levels in the field.

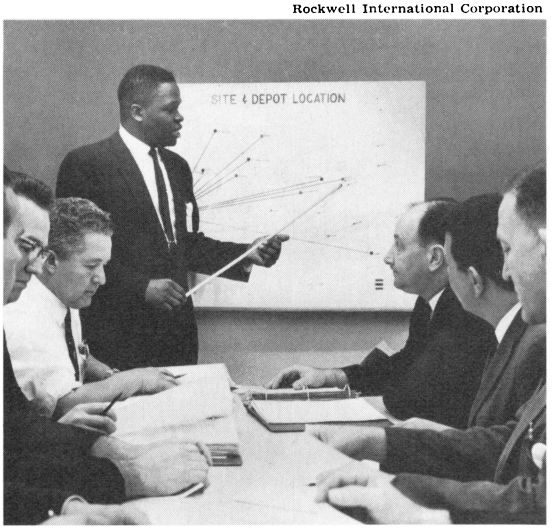
University Level. Business organization occupations at this level can be divided into four groups: (1) administration, (2) accounting, (3) personnel, and (4) advertising.

Administrative workers are executives who make major decisions and have the responsibility of keeping their organizations operating smoothly and efficiently. Most executives direct the work of other executives and such high level employees as accountants, engineers, personnel directors, production managers, and salesmen. The majority of administrative positions are held by persons who have been successful in other university level jobs in the business organization field.

Accounting consists of keeping and using records that are needed to control business operations and to provide information for future planning. Accounting employees develop ways of organizing and keeping data, analyzing recorded data, and reporting the results of their analyses. Controllers, accountants, economists, market researchers, and actuaries are in this group.

An Administrative Meeting in a company may include experts from many different areas of the business organization field.

Rockwell International Corporation



General Electric

Electronic Office Machines are replacing some business organization workers, but they are also creating many new jobs.

Personnel work involves hiring, training, and caring for the employees of a business or institution. Duties involved in personnel work may include recruiting workers, setting wage and salary levels, managing a company cafeteria, or running a company softball league. Some jobs in this area can also be classified as service occupations if they place more emphasis on serving individual employees than on meeting company needs.

Advertising involves influencing what people think of a product, a company, or an institution. It is closely related to public relations. But it works through direct appeals that appear on television and on billboards, and in newspapers and magazines, rather than through personal contact or news stories.

Specialty Level. Clerical workers who assist people in administrative positions make up the largest group on this level. These workers help supply many of the facts on which administrators base their decisions. Ticket agents, secretaries, and general office clerks are in this group. Accounting occupations at the specialty level involve the types of record keeping used by bookkeepers, payroll clerks, and bank tellers. Computer programmers and operators can be classified in this area, because computers are often used to keep records.

Long On-the-Job Training. Workers at this level include bookkeeper's assistants, office machine operators, telephone operators, stock clerks, shipping clerks, and lower level general office clerks. If they develop their skills, they become more valuable to their company and may become eligible for supervisory positions.

Automation is eliminating some jobs at this level. Persons who learn to operate certain new machines are the least likely to be affected.

Short On-the-Job Training. File clerks, duplicating machine operators, and mail carriers are on this level. Their work involves some reading and often some classifying. Much work on this level is being automated. As a result, workers need enough education to learn new procedures and to work with increasingly complicated equipment. Most low-level clerical jobs may disappear someday. Only small businesses will do by hand what business machines and computers can do more quickly and more accurately.

Technology Vocations

Vocations in technology involve producing, operating, maintaining, and transporting nearly all goods and utilities. This field includes engineers, skilled tradesmen and craftsmen, technicians and repairmen, and transportation workers.

The main difference between the technology and science fields is that scientists develop scientific theories and methods, and technologists put them to practical use. But some engineers do scientific work, and some scientists work out commercial production methods. A technician in a scientific laboratory may do the same work as a technician in a factory.

University Level. The various types of engineering, including chemical, civil, electrical, mechanical, and mining and metallurgical, all are in this group. Also included are such occupations as air traffic controller, airline pilot, food technologist, industrial designer, metallurgist, meteorologist, and technical writer.

Many high school students think they are interested in university level technological occupations. They do well in science and mathematics courses, and enjoy working with tools and machines. But about half the students who enter engineering college change to some other major during their freshman year. Students who are technologically inclined should test their abilities and interests thoroughly before choosing a vocation.

Specialty Level. This level includes such familiar trades as those of automobile mechanic, baker, carpenter, and plumber. Most of these trades are becoming increasingly complex. Also included are newer occupations involving air conditioning, dental technology, electronics, and X-ray technology.

Most technicians and repairmen on this level are trained to follow technical procedures, and to operate and repair complex equipment. Their work sometimes appears similar to that of a scientist or engineer. But instead of creating new developments or methods, or finding ways to apply them, they follow the directions of higher level technologists.

Technicians and repairmen are becoming increasingly important with the spread of automation and the development of complex equipment.

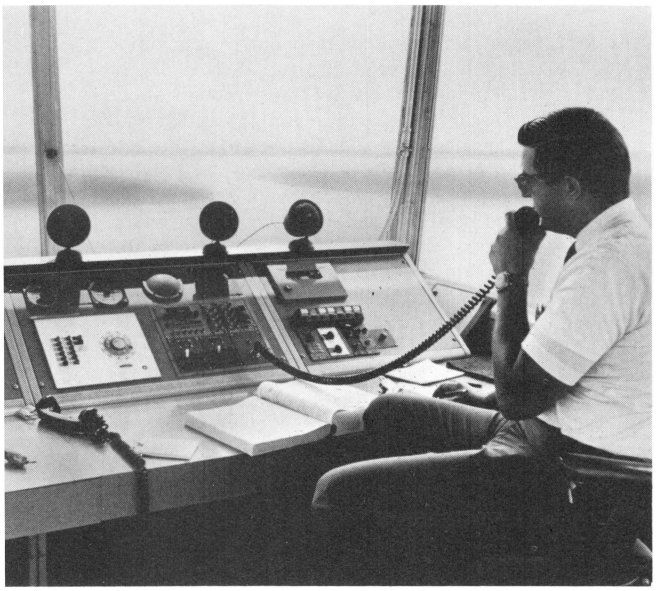
Long On-the-Job Training. Occupations on this level include house painting, welding, machine operation, and bus and truck driving. A number of them are being replaced by automation and more efficient work methods. People in some of these jobs are in danger of having unstable careers unless they acquire better skills.

Many trades now classified on the specialty level were once learned in apprenticeships. Some apprenticeship opportunities still exist in baking, carpentry, printing, and other older trades. But the easiest way to enter such trades is with specialty training.

Short On-the-Job Training. Factory and farm laborers are classified on this level. They learn their work in a few hours, receive low pay, and are easily laid off or replaced. Some of the activities involved include running errands and moving, sorting, or packing materials.

Air Traffic Controllers must use complex procedures and make quick, accurate decisions to assure safety in air travel.

Matthew Goyen, Artstreet



Technicians and Repairmen must keep up with advances in technology so they can work with complex new equipment.

Matthew Goyen, Artstreet

A few jobs at this level may provide a good beginning for people who are forced to go to work without special training. But they are helpful only as jobs in which to learn and from which to move ahead. Automated machinery is taking over much of the work.

Science Vocations

Science occupations involve the study of the physical, biological, and behavioral sciences. Scientists work to determine how and why things are as they are. They use scientific principles to solve problems, to develop new areas of knowledge, and to try and learn more about existing areas of knowledge. Physicists, chemists, zoologists, and geologists all belong in this field.

The science field includes some persons who study science in order to use it in practice—physicians, dentists, pharmacists, and medical technologists. Because of the complex and technical work involved, most jobs in this field require at least a bachelor's degree. Scientists also need technicians and aides who can do some types of work under supervision.

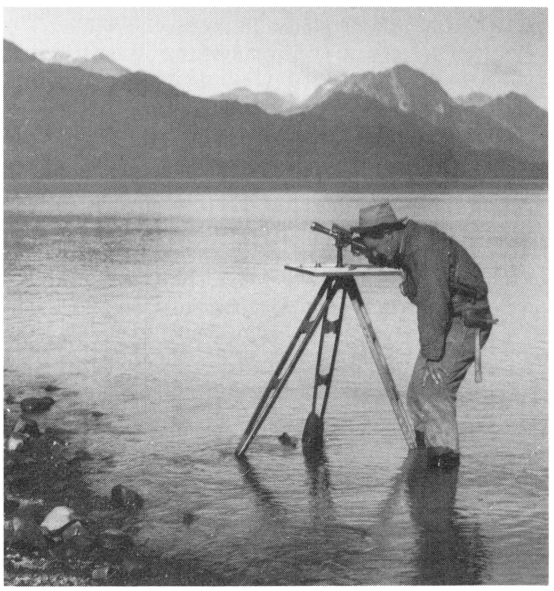
University Level. In the physical sciences, most chemists, mathematicians, and physicists with doctor's degrees occupy teaching or research positions. They are also in demand for their skills in solving problems for business, industry, and government. Those holding bachelor's or master's degrees usually work under the supervision of a scientist with a higher degree. Included in the physical sciences are geologists and cartographers. Their special area, sometimes known as earth science, is becoming more important with the increasing need for understanding and finding raw materials.

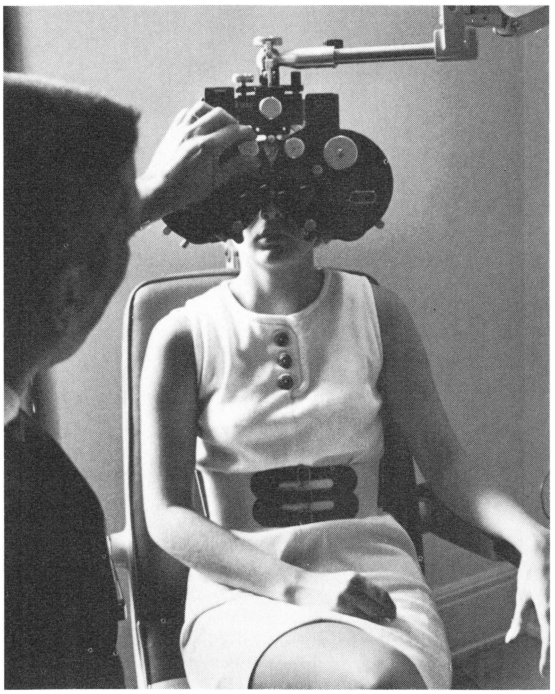
In the biological sciences, people on the university level in addition to physicians and dentists include zoologists, botanists, pharmacists, psychologists, and optometrists.

Specialty Level. Men and women in these occupations assist scientists. The jobs include those of medical technologist, medical and dental technician, dental hygienist, soil conservationist, and optician.

Geologists use their extensive knowledge of physical science to study the earth in man's search for natural resources.

U.S. Geological Survey





WORLD BOOK photo

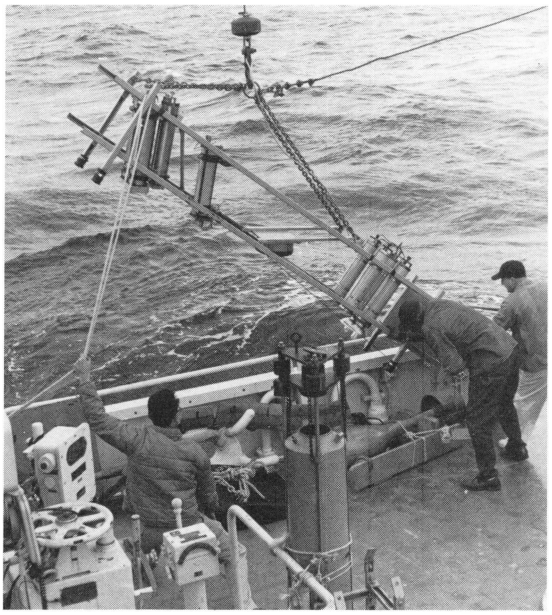
Optometrists specialize in an area of biological science. They treat problems of vision by prescribing eyeglasses.

On-the-Job Training. Few jobs at the on-the-job training level are actually scientific. For this reason, science occupations are not divided into short on-the-job training and long on-the-job training groups. Occupations on this level include those of hospital attendant, orderly, and nurse's aide. They are sometimes classified in the service field, but such personnel must have some knowledge of the condition of patients with whom they work. The steady need for medical services assures a continuing demand for these jobs.

Outdoor Vocations

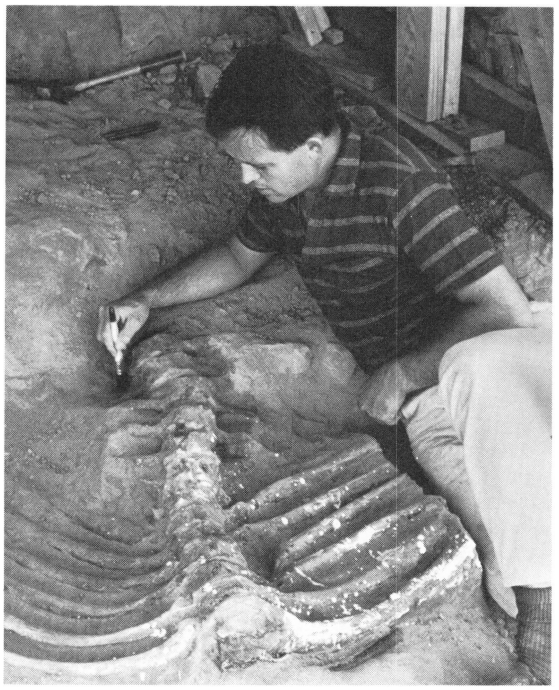
Outdoor occupations include a variety of jobs that involve outdoor activity and working with natural resources. The work in this field is based on the biological and physical sciences. It includes cultivating the soil, caring for natural resources, harvesting or mining natural products, and breeding and raising animals. The basic outdoor occupations are those associated with agriculture, forestry, mining, and marine work.

The demands for workers in outdoor vocations are changing. In agriculture, scientific farming methods are reducing the need for farm laborers, but increasing the need for well-trained agriculturalists. In mining, with the development of new sources of fuel and materials, coal mining and some other specialty areas are decreasing in importance. Other areas, including uranium mining and petroleum extraction, have grown in importance. In forestry and landscape architecture, jobs



Woods Hole Oceanographic Institution

Oceanographers investigate uses for the seas. Their work may someday lead to new types of underwater agriculture.



Authenticated News Int.

Archaeologists are social scientists who study all kinds of ancient objects to learn more about past civilizations.

concerned with community planning and the conservation of natural resources are expected to grow. The demand for recreational land is increasing because automation is creating more leisure time for factory and office workers. The expansion of suburban areas and the modernization of cities have resulted in a need for careful community planning. In marine work, new uses for seawater, and new developments in underwater agriculture and mining are creating new jobs.

University Level. Outdoor occupations on this level include those of farm manager, nursery manager, forester, fish culturalist, mining engineer, and landscape architect.

Specialty Level. The general areas of farming and forestry offer opportunities on this level. Specific areas include dairy farming, fruit growing, horticulture, nursery management, soil and wildlife conservation, and surveying.

Long On-the-Job Training. Many farmers have learned their vocations on the job. But advanced farming methods are making formal agricultural training more desirable. Most oil well workmen and miners, and some forest and conservation workers can be classified on this level.

Short On-the-Job Training. Outdoor occupations filled by unskilled laborers are gradually being taken over by machinery. Farm machines have replaced many workers who performed such tasks as harvesting crops. Bulldozers and other earth-moving equipment have replaced men with picks, shovels, and wheelbarrows who once worked on road construction.

Farm workers are still needed for such jobs as berry picking and vegetable farming. Nurseries, well drilling companies, and lumber camps also employ some unskilled laborers. Many jobs on this level are available only for short periods during certain seasons.

General Culture Vocations

These occupations are concerned with studying, recording, and preserving cultures and ways of life. They include vocations associated with the humanities—history, philosophy, literature, religion, languages, and linguistics. They also include positions involved with education, journalism, law, and library science. Some general culture occupations might be classified in more than one field. Ministers, priests, rabbis, and teachers, for example, could be placed in the service field.

University Level. General culture vocations on this level fall into four categories: (1) the behavioral sciences, (2) the social sciences, (3) literary occupations, and (4) educational and religious occupations. A college or postgraduate degree is essential for most of these occupations. It is required by law for some.

Behavioral scientists study the beliefs, ways of life, and behavior of man from different standpoints. Anthropologists trace man's general ways of living in various societies, from primitive to modern. Sociologists are concerned with the behavior of such groups as labor unions, slum dwellers, or suburbanites. Psychologists study the behavior of individuals. Urban planners develop ways of improving city living. Economists collect and analyze facts needed in business, industrial, and government planning.

Included in the social sciences are political scientists, historians, and lawyers. Some of their jobs are closely related to occupations in other areas. Political scientists and historians have much in common with economists. The work done by lawyers sometimes resembles

that done by journalists, social workers, or teachers.

Persons in literary occupations include biographers, journalists, and librarians. Their work requires general background knowledge in various subjects, along with the ability to pass information on to others.

Educational and religious occupations involve mainly classroom teaching and religious leadership. Jobs in education include teaching and the administration of a school or a school system. Clergymen often must provide religious education and control the financial operations of their church or synagogue, in addition to normal religious duties.

Specialty Level. Alertness and an ability to express ideas clearly and easily are important factors in most general culture positions on this level. Such jobs include those of some newspaper reporters and radio and television announcers. Many reporters at this level cover sports, police news, and other routine matters. Language translators, shorthand and court reporters, and legal secretaries are also in this group.

Earnings and job security vary in specialty level cultural occupations. Some television announcers are highly paid, and most court reporters earn good salaries. But many newspaper reporters are rather poorly paid.

On-the-Job Training. Most jobs on this level are poorly paid, and many are available only on a short-term or part-time basis. Such positions include those of library assistant and ballroom dancing teacher.

Arts and Entertainment Vocations

Men and women aiming for vocations in this field must have special skills in the fine and applied arts, in entertainment, or in recreation.

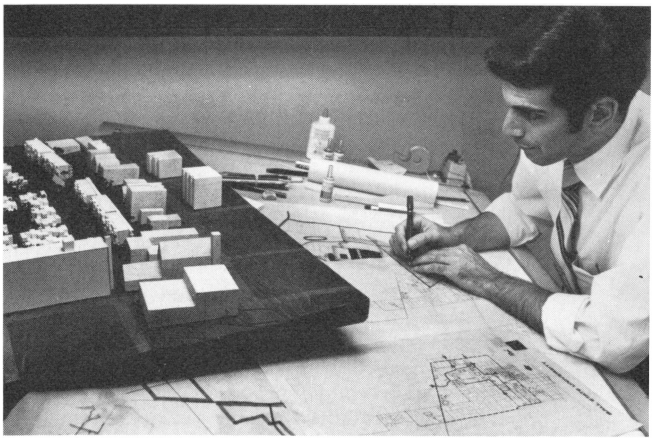
University Level. Occupations on this level appeal to persons who desire artistic, musical, or literary careers. Some people become successful in the arts or entertainment with little formal training. But college preparation greatly increases the chances of success.

Artistic occupations include those of architect, art director, art teacher, commercial artist, and industrial designer. Commercial artists, industrial designers, and others whose talents are used in business, industry, or education can usually find better positions than independent creative artists. Painters, for example, often have great difficulty selling their paintings.

Musical occupations involve performing, composing, teaching, or even publishing music. College training is especially important for persons who specialize in classical music. Serious creative musicians, like creative artists, must have unusual talent and determination to achieve financial security. Music teachers probably have the most secure musical career.

Literary careers are followed by actors, fiction writers, and playwrights. Earning a living with creative literary skills can be difficult. Actors, especially, have unstable careers unless they are among the few who achieve fame. Some literary people turn to journalism or publishing for stable careers, and do creative writing in their spare time.

Specialty Level. Many advertising layout artists, commercial artists, fashion designers, interior decorators, and photographers have occupations at this level. Instrumental musicians who play in small orchestras and bands, and popular singers are also classified in this group.



WORLD BOOK photo

Architects spend many hours at the drawing board. They try to create designs that are both functional and attractive.

WORLD BOOK photo

Layout Artists organize printed material so it is pleasing to read. Most of them work in advertising or publishing.

On-the-Job Training. Arts and entertainment people on this level include florist's helpers who arrange flowers, letterers for advertisements and posters, and some popular musicians and popular singers. A few jobs in the group may be taken over by automation.

VOCATIONS / *Counseling as a Career*

People are becoming increasingly aware of the need for vocational guidance. As a result, there is a growing demand for vocational counselors. Counselors are needed not only in high schools and colleges, but also

in government agencies, religious and social agencies, and business and industry.

The increasing number of persons attending schools is creating a large number of school counseling positions. Government and private agencies offer especially good opportunities for counselors trained to work with handicapped and older workers. Opportunities are also available in industry, where counselors are needed for personnel work. The U.S. Department of Labor issues reports covering employment possibilities for counselors in schools, in the field of rehabilitation, and in employment offices.

Most counselors have a master's or doctor's degree in either guidance or psychology. In preparing for graduate work in counseling, a student should have a broad liberal education with courses in labor economics, psychology, sociology, and statistics. Graduate training includes courses that help the student understand (1) human development and the types of problems people have, (2) techniques for identifying a person's strengths and weaknesses, and (3) methods of helping a person develop his potential.

DONALD E. SUPER

VOCATIONS/*Study Aids*

Related Articles in WORLD BOOK include:

CAREER OPPORTUNITIES

The following articles contain information helpful to a general understanding of a vocational area. Many of the articles include Career sections and give qualifications and sources of further information.

Accounting
Advertising
Agriculture
Air Conditioning
Air Force, United States
Airplane Pilot
Anthropology
Archaeology
Architecture
Army, United States
Astronomy
Audiology
Auditor
Automobile
Aviation
Ballet
Banks and Banking
Biology
Bookkeeping
Botany
Building Trade
Business
Chemistry
Chiropractic
City Planning
Clothing
Coast Guard, United States
Commercial Art
Computer
Conservation
Criminology
Dancing
Dental Hygiene
Dentistry
Dietitian
Economics
Electricity
Electronics
Engineering
Engineering Technician
Entomology
Federal Bureau of Investigation
Fire Fighting
Flight Attendant
Florist
Forest and Forest Products
Funeral Director
Geology
Government
Hairdressing
Handicapped
Homemaking
Hospital
Hotel
Industrial Design
Insurance
Interior Decoration
Iron and Steel
Journalism
Labor
Law
Library
Marine Corps, United States
Mathematics
Mechanical Drawing
Medicine
Merchant Marine
Metallurgy
Meteorology
Mining
Modeling
Motion Picture
Music
Navy, United States
Nuclear Energy
Nursing
Occupational Therapy
Ocean
Office Work
Ophthalmology
Optometry
Osteopathy
Petroleum
Pharmacy
Photography
Physical Education
Physical Therapy
Physics
Plastics
Police
Post Office
Printing
Psychiatry
Psychology
Public Relations
Publishing
Radio
Railroad
Real Estate
Recreation
Religious Education
Repairmen and Mechanics
Research
Restaurant
Retailing
Salesmanship
Science
Ship
Social Work
Sociology
Speech Therapy
Surveying
Taxidermy
Teaching
Telephone
Television
Theater
Toolmaking
Veterinary Medicine
Writing
Zoology

OTHER RELATED ARTICLES

Apprentice
Civil Service
Employment Agency
Fellowship
Foreign Service
Guidance
Letter Writing
Peace Corps
Scholarship
Vocational Education

Outline

I. Choosing a Vocation
- A. Why Work?
- B. What Is Success?
- C. Making Vocational Decisions
- D. Factors in Vocational Development

II. Kinds of Careers
- A. Career Patterns
- B. The Stages of a Career
- C. Exploring Vocations

III. Getting a Job
- A. Knowing Oneself
- B. Finding Opportunities
- C. Making Contacts
- D. Filling Out Application Blanks
- E. Writing a Résumé
- F. Being Interviewed
- G. Deciding on a Job
- H. Adjusting to a Job

IV. Vocational Guidance
- A. Counselors
- B. Books and Pamphlets

V. Fields of Work
- A. Service Vocations
- B. Business Contact Vocations
- C. Business Organization Vocations
- D. Technology Vocations
- E. Science Vocations
- F. Outdoor Vocations
- G. General Culture Vocations
- H. Arts and Entertainment Vocations

VI. Vocational Counseling as a Career

Questions

What is the difference between a stable career and a conventional career?

For what reasons do people work, other than to earn a living?

What is a résumé?

What is aptitude? How does it affect vocational development?

What are the four general levels used in vocational classification?

Which stage in a person's career is the most important?

In what ways can a vocational counselor help a job seeker?

What are the eight main fields used in vocational classification?

Where can information about jobs and employers be found?

In what ways can a person obtain information about himself that will help him choose a vocation?

Books to Read

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UNITED STATES BUREAU OF LABOR STATISTICS. *Occupational Outlook Handbook: Employment Information on Major Occupations for Use in Guidance.* U.S. Government Printing Office. A survey of occupations in the United States published every two years.

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VODER is the name of a device that imitates the sounds of human speech by electrical and electronic means. The name came from the initials of its full name, which is **V**oice **O**peration **D**emonstrator. The voder has a keyboard. When the operator presses certain keys, various sound-producing devices in the voder create the effect of human speech. The voder can speak entire sentences, and can even master the pronunciation of such difficult words as *Albuquerque.* The voder can imitate the voice of a man, woman, or child. It can also imitate a sheep's bleat and a pig's grunt. It uses two special vacuum tubes, and can make a total of 23 different and fundamental sounds, with hundreds of combinations of these sounds. RAYMOND F. YATES

VODKA. See ALCOHOLIC DRINK (Akvavit).

VODUN. See VOODOO.

VOGELWEIDE, WALTHER VON DER. See WALTHER VON DER VOGELWEIDE.

VOGT, WILLIAM (1902-1968), was an American ecologist and ornithologist. He served as chief of the conservation section of the Pan American Union and became national director of the Planned Parenthood Federation in 1951. Vogt wrote *Road to Survival* (1948), a book dealing with the relationship between world populations and food supplies. Vogt was born in Mineola, N.Y. After he graduated from St. Stephens College (now Bard College), Vogt edited *Bird Lore Magazine.* ROGERS MCVAUGH

VOICE. Almost all animals have voices. A few animals, like the giraffe, rarely use their voices. But most higher animals can bark, cry, howl, groan, growl, chirp, or make some other noise. Many of the animals use their voices to communicate with each other. Birds can make music with their voices. Dogs can express several feelings with their voices. They whimper when begging or when they feel guilty, they growl when angry, and bark eagerly when they are happy. Several of the zoo animals, such as the chimpanzee, also make various sounds to show different feelings. But no animal's voice is as highly developed as man's.

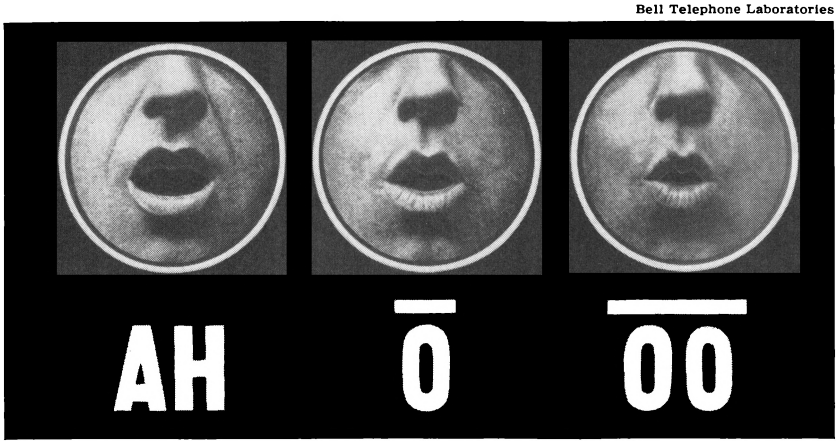
The Human Voice can express difficult ideas through a variety of arrangements of consonant and vowel sounds. It can also be used for singing. It can combine speech with music, and sing words. With his highly developed voice, man has developed elaborate languages. These allow us to tell each other the most exact details of our thoughts and actions.

The vocal cords are the main sound producers in man. These two small bands of tissue stretch across the *larynx* (voice box). One band stretches on each side of the windpipe opening. Muscles in the larynx stretch and relax the vocal cords.

When we breathe, we relax our vocal cords so they form a V-shaped opening that lets air through. When we speak, we pull the vocal cords by the attached muscles, narrowing the opening. Then, as we drive air from the lungs through the larynx, the air vibrates the tightened vocal cords and sound results.

Varying the Sound. The voice mechanism is so well organized that we use our vocal cords, muscles, and lungs in many combinations without thinking about it. The more tightly the vocal cords are stretched, the higher are the sounds produced. The more relaxed the cords, the lower the sounds. Even in normal speech we stretch and relax the vocal cords to many degrees. This

Bell Telephone Laboratories



The Lips Help Form Sounds of the voice. They are fairly wide apart, *left,* to shape the sound "ah." They are drawn more closely together to form the long "o," *center,* and puckered with a small opening, *right,* to exclaim "Oo!"

stretching and relaxing produces variations in the sounds of our voice.

The pitch of the voice is determined by the size of the larynx. Women's voices are usually pitched higher than men's because their vocal cords are shorter. Boys and girls have vocal cords about the same size until the boys reach puberty. Then the voice boxes of the boys suddenly grow larger and their voices change to a lower pitch.

The tongue, lips, and teeth also help shape the sounds of the voice. The nasal cavity gives resonance and color to the voice. When a person gets a cold and his nasal passages stop up, his voice changes.

Straining the Voice affects the vocal cords. So does a general muscular tension caused by nervousness. In the disease called *laryngitis* the larynx is inflamed, irritated, or infected. Sometimes the sick person cannot speak at all for a day or two. ARTHUR C. GUYTON

Related Articles in WORLD BOOK include:

Alto	Singing
Baritone	Soprano
Bass	Stuttering and Stammering
Contralto	Tenor
Conversation	Voder
Laryngitis	Voiceprint
Larynx	Windpipe

VOICE, in grammar, is a feature of verbs. It tells whether the subject of the verb acts or is acted upon. English has two voices, *active* and *passive*.

A verb is in the active voice when its subject is the doer of the action. For example, the verb is in the active voice in the sentence *John sees the picture*, because the subject (*John*) performs the action (*sees*).

A verb is in the passive voice when its subject receives the action. In *The picture was seen by John*, the subject (*picture*) receives the action (*was seen*). The verb is therefore passive. In English, the passive voice consists of some form of the verb *be* (such as *is*, *was*, *were*, or *been*), plus the past participle (such as *seen*). Passive forms of *see* include *is seen*, *was seen*, *were seen*, *will be seen*, *have been seen*, *is being seen*, and *was being seen*. Only *transitive verbs* (verbs that take a direct object) can be changed to passive voice. WILLIAM F. IRMSCHER

See also CONJUGATION; VERB.

VOICE OF AMERICA broadcasts information about the United States to a worldwide audience. It is the radio division of the United States Information Agency (see UNITED STATES INFORMATION AGENCY). The Voice of America broadcasts in English and in 35 other languages over a network of more than 100 transmitters.

The programs originate in Washington, D.C., and are broadcast from short-wave transmitters in the United States. Relay stations operate in Europe, the Middle East, South Asia, and the Far East.

The broadcast time is divided almost evenly between news and such features as commentaries, discussions, drama, and music. The Voice of America began operating in 1942 to inform the world of America's role in World War II.

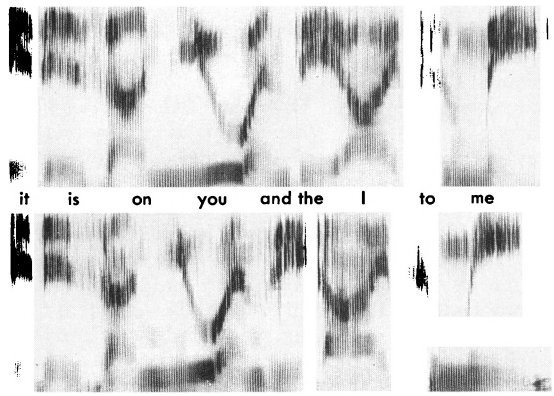
Critically reviewed by the UNITED STATES INFORMATION AGENCY

VOICEPRINT, or SPEECH SPECTROGRAM, is a visual record of the sound waves of a human voice. Voiceprints and tape recordings of the voices of several people are sometimes compared to identify a certain person's voice. But some scientists question the reliability of this method as a means of identification. Voiceprints are also used in the study of speech and hearing disorders.

Several police departments in the United States use voiceprint evidence in criminal cases. They believe the voiceprint method is reliable as a method of identification when used in combination with tape recordings. By the early 1970's, voiceprint evidence had been admitted as evidence by the judge in about 70 criminal cases. However, some experts believe voiceprints are difficult to interpret and are not accurate enough for use in a court of law.

Voiceprints are made by running a tape recording of a voice through an instrument called a *sound spectrograph*. A voiceprint shows the duration of spoken words and the loudness, pitch, and quality of the recorded voice.

Three American scientists at the Bell Research Laboratories developed the sound spectrograph in the 1940's. In 1962, the American physicist Lawrence G. Kersta experimented with voiceprints as a means of identification. From 1968 to 1971, the American audiologist Oscar I. Tosi directed an extensive study of voiceprints at Michigan State University. OSCAR I. TOSI



Voiceprints, like fingerprints, can be used as a means of identification. The two voiceprints shown above were made by the same person's saying the same words at different times.

VOILE, *voil*, is a thin, open cloth made of silk, cotton, wool, rayon, or nylon. It gets its name from the French word *voiler* (to veil). Voile has a plain weave. Widths vary from 36 inches (91 centimeters) for cotton to 54 inches (137 centimeters) for wool. Voiles are used in making dresses, curtains, and trimmings.

VOJVODINA. See YUGOSLAVIA (Government).

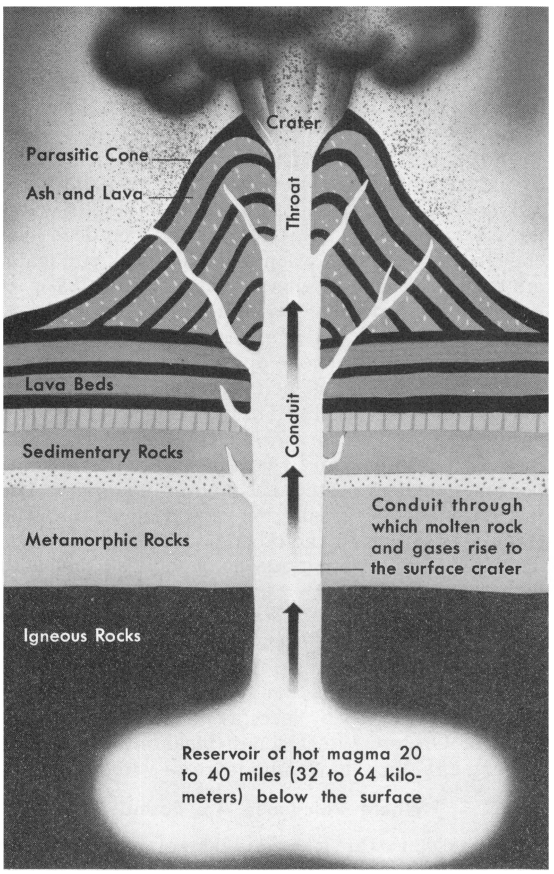
VOLAPÜK, *VOH luh pyook*, was the first widely used universal language. The name of the language comes from two of its words meaning *world* and *speak*. Johann Martin Schleyer (1831-1912), a German priest, created the language in 1879. By 1889, about 200,000 persons were using Volapük, but no one uses the language today. Volapük's vocabulary combined elements from English, German, Latin, and Romance languages such as French and Italian. But many Volapük words were difficult to learn, and the grammar was complicated. MARIO PEI

VOLCANO, *vol KAY noh.* For hundreds of years volcanoes have struck terror and wonder into the heart of man. In ancient times they even moved man to worship. The word volcano comes from *Volcanus*, the name of the Roman god of fire (see VULCAN). The name was first used for Volcano (also spelled Vulcano), one of the Lipari Islands in the Mediterranean Sea, where the god was thought to live.

A volcano is an opening in the earth's surface. Through this opening has come rock so hot that it is in a liquid or gaseous state. This melted rock deep in the earth is called *magma* (see IGNEOUS ROCK). Philosophers once thought that volcanic eruptions came from the burning of natural fuel. Sir Charles Lyell and his associates later showed that volcanic mountains were piled up from the products of their own eruptions.

How Volcanoes Are Formed

Within the last 100 years, scientists have come to a better understanding of what causes volcanoes. But new questions arise with each new gain in knowledge. Even now many scientists doubt the most likely theories. Generally, they believe that chambers of extremely hot magma must lie 20 to 40 miles (32 to 64 kilometers) below the volcano. A passage called a *conduit* carries explosive gases and rock to the earth's surface. From observing hot springs, geysers, and volcanoes themselves, we know that extreme heat exists below the earth's surface. We know this also from the way the temperature rises as we go deeper and deeper into mine shafts and oil wells.



Cross Section of a Volcano. This is the explosive type. It erupts violently, throwing out clouds of volcanic dust.

This increase in temperature at greater depths is called the *geothermal gradient*. But even these facts do not account for the intense heat of the magma in the deepest chambers. Assuming that this intense heat is in the chambers, the conduit to the surface could also be formed partly by the magma that melts the overlying layers of rock. Magma contains much gas, which is made up chiefly of steam, or water vapor. These gases are released as the magma pushes up against the melting roof of its chamber. The gases are so hot that they exert a tremendous explosive pressure on whatever surrounds them. They will sooner or later reach the weaker places in the earth's outer crust as a means of escape. A conduit is then blasted through the earth's surface by the great force of the gases. The magma cools as it comes to the top and becomes *lava*, which flows over the outside of the crater until it hardens.

The eruption at the mouth of a volcano is produced by action of the gas in the upper part of the conduit. From time to time the opening becomes choked by cooling magma. This again causes gases to build up pressure to blast the plugging material into the air.

For many years, scientists have studied volcanoes during eruptions, often under dangerous conditions. Special laboratories investigate the nature and causes of eruptions. One of the most famous laboratories rests on the very slopes of Mt. Vesuvius. Another laboratory is on the brink of Mt. Kilauea in Hawaii. Other laboratories have been established at Mont Pelée in the French West Indies, and in Java. The knowledge gained at these stations has saved many lives and much valuable property. Parícutin volcano in Mexico is famous because scientists have been able to watch its growth closely from its start in a field in February, 1943. Every known scientific method has been used to observe its gradual rise to a height of 1,345 feet (410 meters) above the surrounding area. It is now dormant.

Products of Volcanic Eruption

The smoke that comes out of volcanoes is really a gaseous mixture made up chiefly of steam. At the time of the explosion it is made black by the great amount of extremely fine dust that is carried up with the steam. Other gases that come from erupting volcanoes are carbon dioxide, hydrochloric acid, hydrofluoric acid, and hydrogen. Some volcanoes throw off combinations of sulfur such as hydrogen sulfide and sulfur dioxide. *Solfataras* and *fumaroles* are volcanic vents which expel only gases and magmatic vapors. See FUMAROLE.

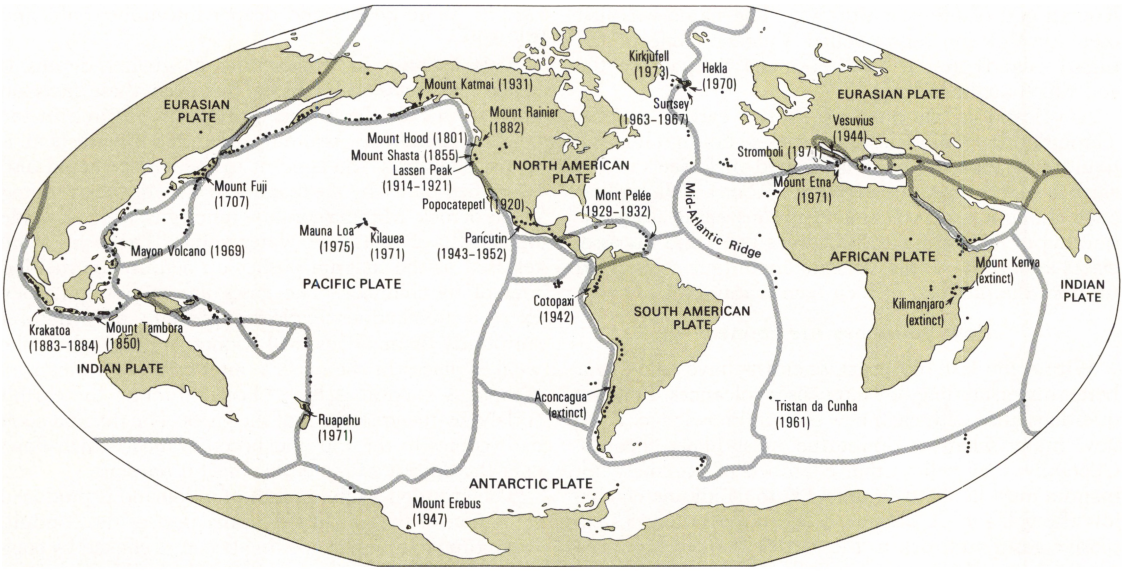
Pieces of rock thrown into the air come either from the crust around the cone of the volcano or from deep within the conduit. Some of these pieces are called *volcanic ash*, which is rock hardened from a melted state. Others are called *lapilli* from the Latin word for *little stones*. *Volcanic bombs* are great pieces of molten lava. Their outer surfaces harden when they reach cool air. Volcanic bombs are often 15 feet (4.6 meters) long. *Bread-crust*, or spindle, bombs are several feet or meters across. They get their name from the crusty appearance caused by

Where Volcanoes Occur

This map shows the location of many volcanoes and when each last erupted. The map also shows the earth's crustal plates. Volcanoes usually occur along the edges of the plates.

Volcanoes

Plate boundary



WORLD BOOK map; volcanic eruption dates from *VOLCANOES* by Gordon A. MacDonald. ©1972 by Prentice-Hall, Inc.

gases escaping from the bomb while the outer surface is hardening. Volcanic cinders, ashes, and dust are kinds of hardened lava. Mudflows occur when rain accompanies the force of an explosive eruption, carrying the volcanic dust down in torrents of mud.

Many volcanoes do not throw lava high into the air but push it out in a quiet lava flow. On steep slopes, fluid lava moves quickly in a red-hot mass. As it hardens, the outer surface becomes sticky and dark and finally turns to the rocky stuff we see in lava beds. The two main kinds of lava are called *aa* (rough and scaly), and *pahoehoe* (smooth or ropy).

Spatter cones and *lava tubes* are among the interesting forms in which lava hardens. The spatter cones are shaped like volcanoes and are made up of clots of lava which pile up into steep-sloped cones from a few feet or meters to 100 feet (30 meters) high. Tubes are often found in pahoehoe lava flows. As the lava flows, the outer surface hardens on contact with the air. The inner lava keeps flowing, leaving a cave or tunnel in place of a molten river.

Kinds of Volcanoes

Scientists classify volcanoes in four general groups, Hawaiian, Strombolian, Vulcanian, and Peléean. These are further classified according to the lava material and the way in which it is thrown out, as well as the way gas is released from the magma. The *Hawaiian* volcanoes have a fluid magma which usually erupts without violence. The *Strombolian* volcano has thicker lava from which the gases are released with explosions. In the *Vulcanian* volcano, the magma is almost as thick as tar. Heavy clouds of volcanic dust rise from the violent explosions which come with each eruption. The *Peléean* volcano is the most violent of all. The clouds above its eruptions glow as though they were on fire.

Some volcanoes are constantly *active*. Stromboli, which is on an island in the Mediterranean Sea, erupts so regularly that it has been compared to a lighthouse. Other volcanoes can be called *intermittent* because they erupt at fairly regular periods. Many of these erupt in cycles, with the length of the cycle being fixed by the amount of time needed to make enough heat to produce an eruption. Mount Etna is this kind of volcano. Those that are quiet, but have not been dead long enough for us to know when they will break out again, are called *dormant* volcanoes. Volcanoes that have remained quiet since the beginning of recorded history and probably will not erupt again are called *extinct*.

There are also stages of eruption which vary with the kind of volcano. The life period of a volcano starts with light earthquake shocks. These become sharper and occur more often as the time for eruption nears. Warnings of an eruption can be seen in springs that become hot and contain volcanic salts, and in other signs. The first eruptions are usually the most violent, throwing great clouds of steam and other gases up with the lava. This part of the eruption may go on for some time with more or less violence, or the activity may stop altogether for short periods and then start again. After the main part of the eruption is over, gases and fumes may be quietly expelled for a long time. When the gas stages die out, the volcano is said to be extinct. Some extinct craters are occupied by lakes as in the famous Crater Lake in Oregon. Other cones, including the one at Auvergne, France, have rounded tops without craters.

Where Volcanoes Are Found

Most volcanoes are located in belts of weakness in the earth's crust near the great mountain chains. The volcanic mountain systems are generally near seacoasts.

The Circum-Pacific system, often called the "circle of

Dr. Harold Simon, Tom Stack & Assoc.

Icelandic Photo & Press Service

Volcanoes Create Islands out of lava that rises from the sea floor. The island of Surtsey, *above left,* began to form in 1963, after an undersea volcano erupted about 20 miles (32 kilometers) south of Iceland. Heimaey, another volcanic island 12 miles (19 kilometers) north of Surtsey, was created in prehistoric times. In 1973, a new volcano named Kirkjufell erupted on Heimaey, *above right.*

Franz Lazi, Bruce Coleman Inc.

The Main Crater of Mount Etna lies among smaller craters that puncture the volcano's slopes. This famous volcano in Sicily has erupted many times since the first recorded eruption in 700 B.C. During an eruption, *above,* gases and smoke rise from the craters. Streams of lava also may pour from cracks and craters and flow down the slopes.

Franz Lazi, FPG

A River of Glowing Lava flows down Mount Etna and burns everything in its path. Lava is melted rock. It has a temperature above 1832° F. (1000° C).

fire," includes the volcanoes of the Falkland Dependency, the South American Andes, the West Indies, Central America, Mexico, western United States, the Alaskan peninsula, and the Aleutian Islands. West of the Pacific, this system includes the volcanoes of Japan, Kamchatka, the Kurils, the Philippines, and continues through the Indonesian islands to New Zealand.

In addition, there are many islands in the Atlantic, Indian, and Pacific oceans containing active volcanoes. A few volcanoes, such as Kenya and Kilimanjaro in Africa, lie inland. Erebus, which is still active, and Terror, formerly active, lie in the Antarctic.

Benefits of Volcanoes

Volcanoes are mostly thought of as the causes of some of the world's great disasters. But volcanic force has also brought its share of good to the world. Heat and power come from plants run by volcanic steam in Italy, Sicily, Iceland, Chile, and Bolivia. The most successful of these plants is at Larderello in Tuscany. Hot springs are also used for medicinal, laundry, and bathing purposes.

FAMOUS VOLCANOES

Name	Location	Height In feet	Height In meters
Aconcagua	Argentina	22,831	6,959
Cotopaxi	Ecuador	19,347	5,897
Krakatoa	Indonesia	2,667	813
Lassen Peak	California	10,457	3,187
Mauna Loa	Hawaii	13,677	4,169
Mayon Volcano	Philippines	8,077	2,462
Mont Pelée	Martinique	4,583	1,397
Mount Etna	Sicily	10,902	3,323
Mount Fuji	Japan	12,388	3,776
Mount Katmai	Alaska	6,715	2,047
Mount Tambora	Indonesia	9,350	2,850
Parícutin	Mexico	9,213	2,808
Popocatepetl	Mexico	17,887	5,452
Stromboli	Italy	3,038	926
Vesuvius	Italy	4,190	1,277

Pumice, which comes from lava, has long been used for grinding and polishing, and for the building of roads. Sulfur, another volcanic product, is used in making chemicals. Lava is often used for building material. Lava beds are important sources of water supply because they are porous and allow fresh water to gather in underground reservoirs. Such reservoirs are the chief source of drinking water in Hawaii. Many countries have rich soils formed by decayed volcanic products.

Famous Volcanic Eruptions

The eruption of Vesuvius in A.D. 79 is the best known in history. When Skaptarjökul, Iceland, erupted in 1783, one fifth of the population was killed. A major eruption occurred in 1883, when Krakatoa, between the islands of Java and Sumatra, exploded. It threw out nearly 5 cubic miles (21 cubic kilometers) of material, and created a huge tidal wave that killed about 36,000 persons on nearby islands.

When Mont Pelée, on Martinique, erupted in 1902, it destroyed the town of Saint-Pierre and took 38,000 lives. Mont Pelée erupted less severely between 1929 and 1932. Mount Katmai, in Alaska, erupted in 1912. Its area has been made a national monument.

Other large eruptions occurred at Mauna Loa, in 1950; at Hibok Hibok, on a Philippine island, in 1950 and 1951. Ilha Nova erupted from the Atlantic Ocean in the Azores in 1957. Now 150 feet (46 meters) above sea level, it connects with the island of Fayal. In 1963, Mt. Agung on the Indonesian island of Bali erupted and killed about 1,500 persons. Also in 1963, Surtsey, an island about 20 miles (32 kilometers) south of Iceland, began forming. At the end of the last lava flow in 1967, Surtsey was 567 feet (173 meters) high and covered over 1 square mile (2.6 square kilometers). FRANK PRESS

Related Articles in WORLD BOOK include:

VOLCANOES

Aconcagua	Ixtacihuatl	Mount Fuji
Alaska (Land Regions)	Kilauea	Mount Hood
Aniakchak	Kilimanjaro	Mount Kenya
Ararat	Krakatoa	Mount Rainier
Chimborazo	Lassen Peak	Mount Shasta
Cotopaxi	Mauna Kea	Parícutin
Diamond Head	Mauna Loa	Pichincha
El Boquerón	Mont Pelée	Popocatepetl
El Misti	Mount Apo	Stromboli
Hekla	Mount Etna	Vesuvius

OTHER RELATED ARTICLES

Cement and Concrete (History)	Crater Lake	Geology	Hot Springs
	Dust	Geyser	Lava
	Earthquake	Hawaii (picture)	Pumice
Crater	Fumarole		

VOLCANO ISLANDS are three small volcanic islands in the northwest Pacific Ocean. They lie between the Bonin Islands and the Marianas, midway between Saipan and Tokyo (see PACIFIC ISLANDS [map]). They are called Kita-Iō-jima (North Sulfur Island), Iwo Jima, and Minami-Iō-jima (South Sulfur Island). Before World War II, Japanese farmers raised sugar cane on Kita-Iō-jima. It covers 2 square miles (5 square kilometers) and rises 2,630 feet (802 meters). The uninhabited southern island is a volcanic cone, 3,180 feet (969 meters) high. U.S. Marines fought on Iwo Jima in World War II. See also IWO JIMA. EDWIN H. BRYAN, JR.

VOLE is a mouse-like animal. Voles have plump bodies about 5 inches (13 centimeters) long. They have short or medium-length tails, short legs, and tiny ears. Most have gray fur. The many *species* (kinds) are usually named for their *habitats* (places where they live). *Meadow voles* are the most common North American species. They live in grassy fields, and eat grass, roots, and seeds. *Water voles* live near water. *Tundra voles* live in cold, swampy plains called *tundra*.

Voles are closely related to lemmings. The vole population changes greatly every three or four years, as does the number of lemmings (see LEMMING). The number of voles may increase by 20 times in this period. Then, presumably because of enemies, diseases, and lack of food, it drops sharply to its original level.

Scientific Classification. Voles are in the New World rat and mouse family, *Cricetidae*. Meadow voles are genus *Microtus*; a common species is *M. pennsylvanicus*. DANIEL BRANT

VOLGA-BALTIC WATERWAY. See CANAL (table).

VOLGA RIVER, *VAWL guh*, is the longest river in Europe. It flows entirely within Russia. The Volga and its branches provide more than 20,000 miles (32,000 kilometers) of water travel and transportation for a region in which about 50 million persons live. The Volga begins in the Valdai Hills, 200 miles (320 kilometers) southeast of Leningrad. It winds 2,293 miles (3,690

kilometers) to its great delta mouth in the Caspian Sea (see RUSSIA [physical map]). The Volga Delta is about 70 miles (110 kilometers) wide and has more than 200 outlets. It is 86 feet (26 meters) below sea level. The most important branches of the Volga are the Oka, the Kama, and the Unzha rivers.

Commerce. The Volga is frozen for most of its length during three months of each year. Canals link it with the Baltic Sea, the Arctic Ocean, the Don River, and Moscow. They are important in bringing products of the Volga Valley to the Russian borders.

The fertile river valley is a great wheat-growing region and the center of a large petroleum industry. The Volga Delta and the nearby waters of the Caspian Sea make up one of the world's great fishing grounds. Astrakhan' is the center of the caviar industry. Loading wharves along the Volga often have to be moved up higher, since the Volga River is always eating away its banks.

Volgograd (formerly Stalingrad) and Gorki are important manufacturing cities on the banks of the Volga. Saratov, Kazan, and Kuybyshev are other important cities on the river. Two of the world's largest dams block the Volga at Kuybyshev and Volgograd. Other large dams operate near Saratov, Gorki, Rybinsk, and Cheboksary.

History. The ancient scholar Ptolemy of Alexandria mentioned the Volga in his *Geography*. The river basin was important in the history of the great movements of people from Asia to Europe. A powerful Bulgarian empire once flourished where the Kama River joins the Volga. Volgograd was the scene of the major Russian victory over Germany in World War II. The deep feeling of the Russians for the Volga has been told many times in their songs and literature. THEODORE SHABAD

See also OKA RIVER; RIVER (color chart).

VOLGOGRAD, *VAWL guh graht* (pop. 834,000), is an important manufacturing city in Russia. It lies on the west bank of the Volga River, about 250 miles (402 kilometers) above the river's mouth (see RUSSIA [political map]). Volgograd factories make aluminum, and tractors and other heavy machinery.

Volgograd was founded in the 1200's. Its name was originally Tsaritsyn. In 1925, it was renamed Stalingrad in honor of the Soviet leader Joseph Stalin. In 1961, Stalin was downgraded and dishonored throughout Russia, and the city was renamed Volgograd. During World War II, the city was an important point in the German drive into Russia. Soviet armed forces defended the city and finally captured a large German army after a long battle. Following World War II, a large dam and a hydroelectric plant were built on the Volga River just north of the city. THEODORE SHABAD

See also STALINGRAD, BATTLE OF.

VOLKSWAGEN. See AUTOMOBILE (World War II and After; picture).

VOLLEYBALL is a game in which the players hit a ball back and forth across a net with their hands. Volleyball ranks as one of the world's most popular team sports.

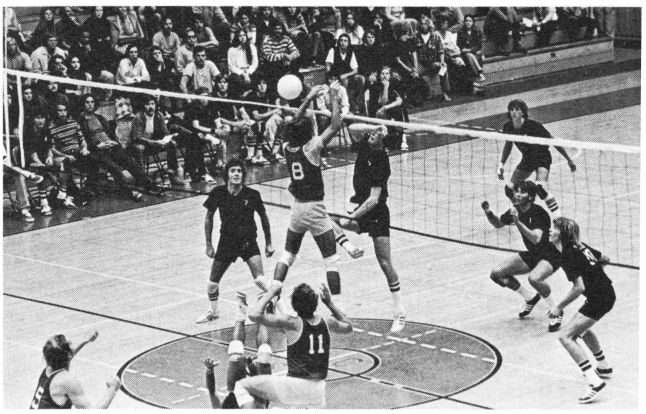
William G. Morgan, a physical-education instructor at the YMCA in Holyoke, Mass., invented volleyball in 1895. Today, the game is most popular in Asia and Europe. Volleyball became an official sport of the Olympic Games in 1964. More than 120 nations, including the United States and Canada, belong to the International Volleyball Federation. This organization sponsors annual tournaments for men's and women's teams.

The Ball is round and has a cover made of leather, plastic, or rubber. When filled with air, a volleyball measures about $8\frac{1}{4}$ inches (21 centimeters) in diameter and weighs about $9\frac{1}{2}$ ounces (270 grams).

The Court. Volleyball is played on a court that measures 60 feet (18 meters) long and 30 feet (9 meters) wide. A net suspended across the center of the court divides it in half. The top of the net is 8 feet (2.4 meters) high for men's games and 7 feet $4\frac{1}{4}$ inches (2.2 meters) high for women's competition.

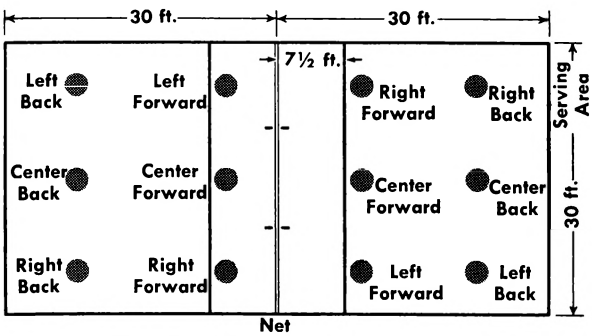
Each team has six players—right back, center back, left back, left forward, center forward, and right forward. Until the ball has been served to start each play, players must assume a position on the court according to the order in which they serve. A referee, an umpire, and two linesmen serve as officials for the game.

The Game starts with a serve by the right back of the serving team. He serves the ball by hitting it with an arm or a hand. The serve must pass over the net into the receiving team's court. The receiving players must return the serve by cleanly hitting it with their hands. They cannot catch, lift, scoop, or throw the ball. A



United States Volleyball Association

Volleyball Games provide spirited fun and exercise for young people and adults. The players bat a ball back and forth across a high net, and often leap high to *spike* a ball, or drive it downward. Volleyball can be played on both indoor and outdoor courts and by mixed teams of boys and girls. The diagram, *below*, shows the positions for six-man teams.



team may hit the ball no more than three times before sending it back over the net.

The players on each team try to hit the ball to the floor of the other team's court. They often try to *spike* (slam) the ball past the opposing players, who leap and dive to prevent it from touching their floor. No player may touch the ball twice in a row unless he has made the first touch blocking an opponent's spike.

Only the serving team can score. It scores a point each time the ball touches the receiving team's floor. The serving team also scores a point if an opposing player hits the ball out of bounds or commits a foul. The right back continues to serve after each point until a serve hits the net, goes out of bounds, or is faulty in some other way. His team also loses the serve if it fails to return the ball. A loss of serve is called a *side out*.

After each side out, the opposing team serves the ball. But first, each of its players rotates clockwise one position. The right forward moves to the right back position, the right back becomes the center back, and so on. The first team to score 15 points wins the game, but it must win by at least 2 points. If the score is 15 to 14, for example, the game continues until one team wins by 2 points. Critically reviewed by the UNITED STATES VOLLEYBALL ASSOCIATION

VOLLMER, AUGUST (1876-1955), was a police administrator, consultant, author, and criminologist. He became famous for his contributions to police professionalization. As the police chief of Berkeley, Calif., from 1905 to 1932, he began practices which made his department internationally famous.

The lie detector was developed under his inspiration and guidance. His interest in the welfare of Berkeley youth led to the formation of America's first community council in 1919. Vollmer also helped establish criminology courses at the University of California in 1916. They led to a school of criminology in 1950. He served as professor of police administration at the University of Chicago from 1929 to 1931, and at the University of California from 1931 to 1938. He wrote four books on criminology, and advised many cities on reorganizing their police departments. Vollmer was born in New Orleans. O. W. WILSON

VÓLOS. See THESSALY.

VOLPE, JOHN ANTHONY (1908-), served as United States secretary of transportation under President Richard M. Nixon from 1969 to 1973. In 1973, he became U.S. ambassador to Italy. Volpe had served as Republican governor of Massachusetts from 1961 to 1963 and from 1965 to 1969.

Volpe was born in Wakefield, Mass., the son of Italian immigrants. He graduated from Wentworth Institute in Boston in 1930. In 1933, he founded a construction company. Volpe headed the successful firm until 1961, except during World War II and during his periods of public service. He served in the Navy during the war. In 1953, Volpe was appointed Massachusetts commissioner of public works. He was named temporary administrator of the federal highway program in 1956, and served for four months. DAVID S. BRODER

VOLSCIANS. See CORIOLANUS, GAIUS MARCIUS.

VOLSTEAD, ANDREW JOHN (1860-1947), a Minnesota Republican congressman from 1903 to 1923, introduced the National Prohibition Act of 1919, better known as the Volstead Act (see VOLSTEAD ACT). He personally opposed saloons more than moderate drinking. He also wrote the Farmers' Co-operative Marketing Act as well as drainage and homestead laws. He was born in Goodhue County, Minnesota, and was graduated from St. Olaf's College. After his election defeat of 1922, he served as counsel to prohibition groups. LOUIS FILLER

VOLSTEAD ACT provided for the enforcing of national prohibition of the use of intoxicating liquors. It was passed by the Congress of the United States in 1919, over the veto of President Woodrow Wilson. Amendment 18 to the Constitution of the United States prohibited the manufacture, sale, or transportation of intoxicating liquors within the United States. The Volstead Act provided the means to investigate and punish violators of the amendment. The act took its name from that of Representative Andrew J. Volstead of Minnesota, who introduced it. The act defined intoxicating liquors as beverages which contain "one-half of one per centum or more of alcohol by volume."

After the ratification of Amendment 21, which repealed prohibition, the Volstead Act expired automatically, except in the Territories. JOHN A. KROUT

See also PROHIBITION; VOLSTEAD, ANDREW JOHN.

VOLSUNGA SAGA, *vahl SOONG guh*, is an Icelandic tale written in the 1100's or 1200's. It is a Scandinavian prose version of the Germanic myths about the Volsungs, a royal family; and Sigurd the Dragon Slayer. It is based directly on parts of the *Poetic Edda* (see EDDA). Richard Wagner used much of the story in his opera series, *The Ring of the Nibelung*. KENNETH CHAPMAN

VOLT, *vohlt*, is the unit of electromotive force that will drive a current of one ampere through a resistance of one ohm. The volt, also, is the unit of work done for each coulomb of charge moved through the circuit (see COULOMB). Voltage may be thought of as a "push" that moves or tends to move a current through a conductor. One volt is practically the electromotive force of a simple voltaic cell. A common dry cell has a voltage of about 1.5. The instrument used to measure voltage is called the *voltmeter*. These terms honor the memory of the great Italian scientist Alessandro Volta. See also AMPERE; ELECTRIC CURRENT; OHM; VOLTA, COUNT; VOLTMETER. E. R. WHITEHEAD

VOLTA, *VAHL tuh*, **COUNT** (1745-1827), ALESSANDRO VOLTA, won fame as the inventor of the electric battery. His discovery of the decomposition of water by an electrical current laid the foundations of electrochemistry (see ELECTROCHEMISTRY). The *volt*, a unit of electrical measurement, is named for him (see VOLT). He also invented the electric condenser.

Count Volta
Culver

Volta was born in Como, Italy, a member of a noble family. By 1774, he had established a reputation by his research work in electricity. SIDNEY ROSEN

See also BATTERY; ELECTRICITY (Flowing Electricity).

VOLTAIC CELL. See BATTERY.

VOLTAIRE, *vaul TAIR* (1694-1778), was the pen name of François Marie Arouet, a French author and philosopher. His clear style, sparkling wit, keen intelligence, large literary output, and strong sense of justice made him one of France's most famous writers.

Candide (1759), Voltaire's best-known work, is a brilliant philosophical tale that has been translated into more than 100 languages. On the surface, it describes the adventures of an inexperienced young man as he wanders around the world. Philosophically, *Candide* is a complex inquiry into the nature of good and evil.

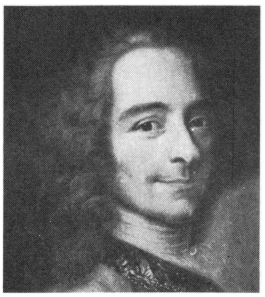
Voltaire, the son of a lawyer, was born in Paris. He received an excellent education at a Jesuit school, where many of the students belonged to the nobility. He showed little inclination to study law, and his schooling ended at the age of 16. He soon joined a group of sophisticated aristocrats who had little reverence for anything except wit, pleasure, and literary talent. Paris society sought Voltaire's company because of his cleverness, his remarkable ability to write verses, and his gift for making people laugh. There are several theories about the origin of his pen name, which he adopted about 1718. The most widely accepted one is that *Voltaire* comes from an imperfect arrangement of the letters making up the French equivalent of *Arouet the Younger*.

Imprisonment and Early Success. In 1717, Voltaire was imprisoned in the Bastille for satirical verses that he may or may not have written ridiculing the government. During his 11 months in prison, he put the finishing touches on his tragedy *Oedipe*. The success of the play in 1718 made Voltaire the greatest French playwright of his time. He maintained this reputation—with more than 50 plays—for the rest of his life. While in the Bastille, Voltaire also worked on *La Henriade*, an epic poem about King Henry IV. This poem, written in the style of the *Aeneid* by the Roman poet Virgil, was published in 1723.

Voltaire became independently wealthy in his early 30's through an inheritance and wise investments. He was also a celebrity who had three plays performed in 1725 to help celebrate the wedding of King Louis XV. Royal pensions and other honors followed. But all this success ended abruptly in 1726 when the Chevalier de Rohan, a powerful young nobleman, scornfully asked: "What is your name anyway? Monsieur de Voltaire or Monsieur Arouet?" Voltaire supposedly replied that whatever his name was, he was bringing it honor, which was more than Rohan could say for himself. This impertinent answer cost Voltaire a beating by Rohan's men. Challenged to a duel by Voltaire, Rohan had him thrown into the Bastille again. A few days later, Voltaire was allowed to choose between continued imprisonment and exile.

Exile and Return to France. Voltaire chose exile. From 1726 to 1729, he lived in England, for him a land of political and religious freedom. In England he met the great writers Alexander Pope and Jonathan Swift. He also was attracted to the ideas of the philosopher John Locke and the famous scientist Sir Isaac Newton. It has been said that Voltaire went into exile a poet and came back a philosopher.

Voltaire returned to France in 1729, and published several works. The most important ones were *History of Charles XII* (1731) and his best-known play, *Zaïre* (1732). In 1733, his *Letters Concerning the English Nation* appeared in England. This book appeared in France the next year in an unauthorized edition called *Philosophical Letters*. Voltaire's praise of English customs, institutions, and style of thought was an indirect criticism of their French counterparts. French authorities condemned the book, and Voltaire fled from Paris.



Detail of a pastel (1736) by Maurice Quentin de Latour; Palais de Versailles, Versailles, France

Voltaire

Voltaire found a home with the Marquise du Châtelet, one of the most cultured and intelligent women of the day. From 1734 to 1749, he lived in her chateau at Cirey in Lorraine. During this period, he wrote several plays, an essay on metaphysics, two works on Sir Isaac Newton, and some poetry. He also wrote two notable philosophical tales. One of them, *Zadig* (1747), explores the problem of human destiny. The other, *Micromégas*, was started at Cirey and was published in 1752. In it, Voltaire used giant visitors from a distant star and from the planet Saturn to discuss man's relative insignificance in the universe.

Later Years. Following Mme. du Châtelet's death in 1749, Voltaire accepted the invitation of Frederick the Great to settle in Berlin. After three years of living under the social and intellectual tyranny of the "Philosopher King," as Voltaire called him, Voltaire settled in Switzerland. For several years he lived near Geneva in a chateau that he named Les Délices (The Delights). It is now the Voltaire Institute and Museum. A severe earthquake in Portugal in 1755 inspired Voltaire to write an important philosophical poem, *The Lisbon Disaster*. This work was published with his *Poem on Natural Law* in 1756.

In 1758, Voltaire purchased an estate called Ferney on the French-Swiss border. He lived there until just before his death. In an effort to correct the wrongs he saw in the world, Voltaire produced a constant flow of books, plays, pamphlets, and letters. Ferney soon became the intellectual capital of Europe. There Voltaire wrote *Candide*, added to his *Philosophical Dictionary*, and completed his *Universal History*, also called *Essay on the Manners and Spirit of Nations* (1759-1766). He fought religious intolerance and aided victims of religious persecution. His rallying cry at Ferney was "Ecrasez l'infame" ("Crush the evil thing"), referring to religious superstition.

Voltaire returned to Paris at the age of 83, and was enthusiastically received. There he saw his last play, *Irène* (1778), warmly applauded. But the excitement of the trip was too much for him, and he died in Paris.

The Roman Catholic Church, because of much criticism by Voltaire, refused to allow him to be buried in church ground. However, his body was finally taken to an abbey in Champagne. In 1791, Voltaire's remains were transferred to the Panthéon in Paris, where many of France's greatest are buried. OTIS FELLOWS

See also CANDIDE.

VOLTE. See DANCING (The Renaissance).

VOLTMETER is an instrument that measures the *voltage* (difference in potential) between two points of an electric current. Most commercial voltmeters are galvanometers connected in series with a high resistance. They have scales that read in volts. A typical direct-current voltmeter has a magnet shaped like a horseshoe. To each *pole* (end) of the magnet is attached a semicircular piece of soft iron that also becomes magnetized. These pieces of soft iron direct the magnetic field toward a small iron cylinder placed between the poles of the magnet. Since soft iron becomes highly magnetized, this cylinder concentrates the magnetic field.

Surrounding the cylinder is a coil of thin copper wire wound on a light, rectangular frame. This coil is the movable coil through which the electric current flows. Each end of the wire coil is connected to a small spiral spring. As the coil moves, a needle attached to the coil also moves. This needle moves across a dial and indicates the reading in volts. Another coil of very high resistance, up to several thousand ohms, is connected in series with the movable coil.

When the voltmeter is not in use, the frame does not move and the needle reads "zero." When a current passes through the movable coil, a magnetic field is set up around the coil. As a result, the magnetic field of the horseshoe magnet acts on the current-carrying wires of the coil to produce a force on the coil. This force causes the coil to turn. The springs oppose the motion of the coil and are adjusted so that the position of the needle indicates the correct voltage. In taking voltage readings, a voltmeter is always placed across the part of the circuit to be measured. E. R. WHITEHEAD

See also GALVANOMETER; POTENTIOMETER; VOLT.

VOLTURNO RIVER, a stream in southern Italy, rises in the province of Campobasso. It flows southeast until it meets the Calore River. The joined streams then flow west past Capua. The total length of the Volturno is about 110 miles (177 kilometers). It empties into the Gulf of Gaeta on the Tyrrhenian Sea, about 20 miles (32 kilometers) southeast of Gaeta. GEORGE KISH

VOLUME of a body is the amount of space it occupies. The unit of measurement for volume is the cube, whose edges are of equal length. The volume of a box, for example, may be measured in cubic feet or cubic meters.

There are several ways of measuring the volume of a substance, depending upon the shape of the substance and whether it is a solid or liquid. The volume of a rectangular solid, such as a box, is found by multiplying the length by the width by the depth. This could be stated in the formula, $v = lwd$. A cubic foot equals 1,728 cubic inches, and a cubic meter equals 1,000,000 cubic centimeters.

The volume of a cylinder is determined by multiplying the area of the base by the height, or $v = \pi r^2 h$. The area of the base is obtained by multiplying π (or about 3.1416) by the square of its radius. The volume of a sphere is computed by the formula $v = \frac{\pi D^3}{6}$ (or about $.524\ D^3$), where D is the diameter.

Liquids are usually measured by special glass devices having a graduated scale. In the customary system of measurement, the main units are the gallon, quart, pint, and fluid ounce. A gallon equals four quarts, a quart equals two pints, and a pint equals sixteen fluid ounces. In the metric system, liquids are measured mainly in milliliters and liters. One liter is equal to 1,000 milliliters. E. G. STRAUS

Related Articles in WORLD BOOK include:

Barrel Density Hogshead Minim Pint Weights and
Bushel Gallon Liter Peck Quart Measures

VOLUNTEER STATE. See TENNESSEE.

VOLUNTEERS OF AMERICA is a religious social-welfare organization which provides spiritual and material services to the needy. It has about 600 program centers throughout the United States. Its spiritual services include missions, Sunday Schools, Bible study groups, and spiritual counseling and guidance.

The organization operates maternity homes and child placement services, summer camps, homes and clubs for the aged, rehabilitation services for the handicapped, residences for working girls, day nurseries, and emergency shelters for the homeless. It sponsors low-cost housing for the poor and the elderly, and has helped establish such housing in many communities. The Volunteers gather clothing and household goods for the needy, and assist prisoners and parolees and their families.

Ballington Booth and his wife, Maud Ballington Booth, founded the Volunteers in New York City in 1896 (see BOOTH [family]). The organization operates on a semimilitary basis. Its officers wear uniforms and hold rank. Headquarters are at 340 W. 85th Street, New York, N.Y. 10024. For membership, see RELIGION (table). Critically reviewed by the VOLUNTEERS OF AMERICA

VOLUTE. See COLUMN (The Greek Orders).

VOLVOX. See PROTOZOAN (Flagellates).

VOMITING, *VAHM it ing*, is the forceful expulsion of the contents of the stomach and intestines through the mouth. In digestion, the muscles of the stomach and small intestine contract and push the stomach contents down through the alimentary canal. In vomiting, these muscles reverse their contractions and push upward. A person usually has a feeling of nausea before he vomits. The medulla of the brain controls vomiting (see BRAIN [The Medulla Oblongata]).

Vomiting may be merely an occasional annoyance, or it may be a sign of serious illness. Unpleasant sights or odors sometimes cause vomiting in a nervous individual. Vomiting may also result from diseases such as blockage of the coronary arteries of the heart, enlargement or obstruction of the gastrointestinal tract, or inflammation of parts of the abdomen. Nausea and vomiting that occur in the early stages of pregnancy are known as *morning sickness*.

Retching is an attempt to vomit. It occurs when the *diaphragm*, a flat muscle between the abdomen and chest, contracts in spasms. However, this action alone does not move the stomach contents. Neither vomiting nor retching empty the stomach completely. If a person vomits uncontrollably for any length of time, a physician should be called. E. CLINTON TEXTER, JR.

See also CHLORPROMAZINE; EMETIC; NAUSEA.

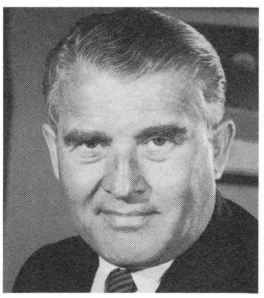
VON is a German word that frequently precedes personal names to indicate nobility or rank. The word means *of* or *from*. It was originally used before names of places or estates.

VON BÉKÉSY, GEORG. See NOBEL PRIZES (table: Nobel Prizes for Physiology or Medicine—1961).

VON BRAUN, WERNHER (1912-), is considered the foremost rocket engineer in the world. He is also a leading authority on space travel. Von Braun directed teams that built the rockets that sent the first American into space and made possible man's first landing on the moon.

Von Braun was born in Wirsitz, Germany (now Wyrzysk, Poland). He experimented with rockets as a child. In 1932, he became an adviser in the rocket program of Nazi Germany. He played a major role in developing the V-2 rocket, with which Germany bombed Allied cities during World War II (1939-1945). In 1944, Heinrich Himmler, chief of the Nazi secret police, tried to take over the German rocket program. He jailed von Braun, who refused to cooperate. Adolf Hitler, the Nazi dictator, freed von Braun later that year.

In 1945, von Braun led a group of German scientists who surrendered to the United States Army. Von Braun and 116 of the other scientists were sent to the United States to work on guided missile systems. In 1954, the Army assigned von Braun and his team to the Redstone Arsenal in Huntsville, Ala., to develop the first large U.S. ballistic missile. Von Braun became a United States citizen in 1955.



NASA

Wernher von Braun

Von Braun's team developed the four-stage Jupiter rocket that launched *Explorer I*, the first United States earth satellite. Another of the group's rockets, the Redstone, launched the flight of America's first astronaut, Alan B. Shepard, Jr., in 1961. Other von Braun projects included the Saturn rockets. In 1969, a Saturn V rocket launched the astronauts who made man's first landing on the moon.

In 1960, the Army transferred von Braun and his team to Huntsville's new George C. Marshall Space Flight Center, operated by the National Aeronautics and Space Administration (NASA). In 1970, NASA appointed von Braun deputy associate administrator for planning. In 1972, von Braun resigned from NASA and became an executive of Fairchild Industries, a major aerospace company. In 1975, von Braun was named president of the National Space Institute, an organization that seeks to promote better public understanding of the U.S. space program. WILLIAM J. CROMIE

See also SPACE TRAVEL (High-Altitude Rockets).

VON KÁRMÁN, *vahn CAR man*, **THEODORE** (1881-1963), became one of the outstanding scientists of the 1900's. His primary interest was aeronautics, but he wrote nearly 150 books and articles on many aspects of engineering, physics, and mathematics. Von Kármán helped found important aeronautical institutions and agencies, including the Guggenheim and Jet Propulsion Laboratories at the California Institute of Technology and the U.S. Air Force Scientific Advisory Board. Von Kármán was born in Budapest, Hungary. He became a U.S. citizen in 1936. CLARK B. MILLIKAN

VONNEGUT, KURT, JR. (1922-), is an American novelist. He is often considered an author of science fiction because he sometimes writes about such subjects as space travel and strange inventions. However, the tone of his works is ironic and shows his primary concern with morality rather than science or technology. Vonnegut particularly stresses the need for humane conduct and values in a world endangered by advanced technology and political tyranny. His *Cat's Cradle* (1963) concerns a new chemical that threatens to destroy the world. But this novel is really a satire on what Vonnegut feels is the irresponsibility of some scientists.

Vonnegut was born in Indianapolis. While serving in the Army during World War II, he was captured by the Germans and spent five months in a prison camp in Dresden. There he witnessed the bombing of Dresden by the Allies. He discusses this bombing in his novels, particularly *Slaughterhouse-Five* (1969). His other novels include *Player Piano* (1952), *God Bless You, Mr. Rosewater* (1965), *Mother Night* (1966), and *Breakfast of Champions* (1973). MARCUS KLEIN

VON NEUMANN, *fohn NOI mahn*, **JOHN** (1903-1957), was an outstanding mathematician. He wrote *The Mathematical Foundations of Quantum Mechanics* (1944), a treatise which showed that two different theories, Erwin Schrödinger's wave mechanics and Werner Heisenberg's matrix mechanics, were equivalent. Perhaps his best-known book was *The Theory of Games and Economic Behavior* (1944), written with Oskar Morgenstern. He also helped organize the first research group in numerical weather prediction. See GAME THEORY.

Von Neumann made major contributions to the design of high-speed electronic computers. They were important in the development of the hydrogen bomb. He was appointed to the U.S. Atomic Energy Commission in 1955. Von Neumann was born in Budapest, Hungary. He became an American citizen in 1937. PHILLIP S. JONES

VOODOO, or VODUN, is the name given to the religious beliefs and the practice of magic of certain African Negro tribes. The word is a West African word which means *god* or *spirit*. The beliefs and practices of voodoo have spread to many parts of the West Indies, and to a few parts of the United States.

According to voodooism, the spirits of the dead live in a world of ghosts, but can visit the world of the living to bless or curse people. The chief magicians bring the living into touch with the dead. A medicine man may talk with a wooden image and say that a spirit answers him through the image. If a man makes a wax image of his enemy and sticks pins into it, he is practicing voodooism to injure his enemy. JOHN MULHOLLAND

See also HAITI (People).

VOR. See AIRPLANE (Radio Navigation; diagram).

VORSTER, BALTHAZAR JOHANNES, *FORS ter* (1915-), became prime minister of the Republic of South Africa in 1966. He replaced Hendrik Verwoerd who was assassinated. Vorster served in Parliament and in Verwoerd's cabinet. As minister of justice, he enforced strict laws against persons who opposed government racial laws. He also enforced South Africa's segregation laws. Vorster was born in Jamestown in Cape of Good Hope Province.

VORTICELLA. See PROTOZOAN (The Ciliates).

VORTIGERN, *VAWR tih gurn*, was the British king who invited the Jutes to come to Britain to help him

fight the Picts about A.D. 449. This event began the Anglo-Saxon conquest of England. Later he fought with Hengist, leader of the Jutes, whose victory led to the founding of the kingdom of Kent. Some legends say he married Hengist's daughter, Rowena. ROBERT S. HOYT

VOSGES MOUNTAINS, *vohzh,* form a short, low mountain range that extends for about 150 miles (241 kilometers) along the western side of the Rhine River Valley. The Vosges form the border between France's provinces of Alsace and Lorraine. The highest peak is Guebwiller (4,672 ft., or 1,424 m). The mountains contain copper, lead, silver, coal, and rock salt.

VOSGES TUNNEL. See LUSSE TUNNEL.

VOSTOK ISLAND is a tiny, uninhabited coral island in the Pacific Ocean, about 580 miles (933 kilometers) north-northwest of Tahiti. In 1820, a Russian naval officer, Fabian von Bellingshausen, became the first known explorer to reach the island. Both Great Britain and the United States claim Vostok Island. See PACIFIC ISLANDS (color map). EDWIN H. BRYAN, JR.

VOTING is a method by which people choose their leaders and decide public issues. Most countries give voting rights to their citizens. But nations that do not have a democratic form of government may not allow their voters any real choices. For example, people in many dictatorships may vote—but only for candidates designated by their leaders.

Citizens in democratic countries consider voting one of their most important rights because it allows them to choose who will govern them. In a majority of these countries, most candidates seek office as members of a political party. The voters elect their public officials directly or indirectly. In *direct elections,* the citizens themselves vote for the officials. In *indirect elections,* the voters elect representatives to choose officials. U.S. citizens elect their President indirectly, through the Electoral College (see ELECTORAL COLLEGE).

Citizens in democracies also participate in local and national affairs by voting. The men and women of a community, for example, might vote on whether to levy a tax to build a recreation center.

Some governments give their citizens special voting rights through the *referendum* and *recall.* Legislatures may ask voters to approve or reject proposed laws in special elections called referendums. Voters may remove an official before his term expires through the process of recall. See INITIATIVE AND REFERENDUM; RECALL.

People also vote for purposes other than to elect officials and to settle public matters. In many societies, members of juries and of clubs, labor unions, and other organizations make decisions by voting.

Who May Vote. The 26th Amendment to the United States Constitution grants the vote to U.S. citizens 18 years or older. However, the Constitution allows each state to set other qualifications for voting, provided they do not violate other guarantees of the Constitution.

In 1970, Congress passed a law allowing anyone who has lived in a state at least 30 days to vote in presidential elections. The Supreme Court of the United States declared in 1972 that lengthy residency requirements for state and local elections were unconstitutional. In 1973, the court ruled that states can require a person to have lived in the state for 50 days and to have registered before voting in nonpresidential elections.

Before the 26th Amendment was passed in 1971, all but 10 states had limited the vote to citizens who were at least 21. The age had been 18 in Alaska, Georgia, and Kentucky; 19 in Massachusetts, Minnesota, Montana, and Wyoming; and 20 in Hawaii, Maine, and Nebraska.

Congress had passed a law in 1970 lowering the voting age to 18. But the Supreme Court of the United States ruled that the law applied only to national elections. The court said that only individual states or a constitutional amendment could change state and local limits. Congress passed the 26th Amendment in March, 1971. By the end of June, the necessary 38 states had ratified the amendment, giving the vote to more than 11 million young men and women.

In Canada, 18-year-olds may vote in national elections. A 1970 law limits the vote to Canadian citizens for national elections after 1975. Until 1975, British subjects who are not Canadian citizens can vote in national elections. Each province sets its own voting qualifications.

Registration is the process by which a person's name is added to the list of eligible voters. On election day, officials check each individual's name against the list before they allow him to vote.

Voters may register by mail or in person. Many states close registration 30 days before each election. In most states, a voter remains registered permanently unless he moves or fails to vote for several years. To vote in primary elections, voters in some states must register as members of a political party.

Restrictions on Voting. Even democratic nations deny some people the right to vote. In the United States, most of the states did not allow women to vote until the 19th Amendment to the Constitution was passed in 1920 (see WOMAN SUFFRAGE). American Indians did not gain voting rights in all the states until 1948. Citizens living in Washington, D.C., could not vote in presidential elections until after passage of the 23rd Amendment in 1961.

Ron Sherman from Nancy Palmer

Voters line up, ballots in hand, to wait their turn to enter a voting booth, *lower left.* Every citizen has not only the right but the responsibility to vote in elections.

In the United States and Canada, persons may not vote if they suffer severe mental illness or retardation or have been convicted of certain crimes. Wartime deserters dishonorably discharged from the U.S. armed forces lose the right to vote in national elections.

Several states have tried to deprive Negroes of their voting rights. Between 1895 and 1910, seven Southern states added *grandfather clauses* to their constitutions. These clauses violated the 15th Amendment to the Constitution, which prohibits a state from denying a citizen the right to vote because of his race. In 1915, the Supreme Court declared such clauses unconstitutional. See GRANDFATHER CLAUSE; FIFTEENTH AMENDMENT.

Some states once required every voter to pay a *poll tax*. Officials in those states often kept blacks and poor whites from voting because they had not paid the tax. The 24th Amendment to the Constitution, adopted in 1964, prohibits poll taxes as voting requirements for national elections. In 1966, the Supreme Court outlawed such taxes for all elections. See POLL TAX.

Many states also once restricted voting rights to citizens who could pass a *literacy test* that indicated a certain level of education. Election officials often tested and disqualified only blacks. In 1970, Congress and the Supreme Court banned these tests.

Voting Districts. In the United States, each county or ward of a state is divided into voting districts called *precincts*. Citizens may vote only at the polling place in the precinct where they live. Election officials at the polling places distribute ballots and count the votes after the polls close.

Methods of Voting. United States citizens consider the secret ballot an important voting right. But in the 1700's, most of the American Colonies conducted oral elections. Later, some states used written ballots but required voters to sign them. Gradually, voting officials realized that oral and signed votes restricted the freedom of voters. Some citizens feared how others would react if they voted as they wished. States began using secret ballots so each man could choose freely.

During the 1890's, the Australian ballot system—which is used today in the United States and Canada—became popular. Under this system, each voter marks a printed ballot while alone in a screened booth. More than half the voters in the United States use voting machines, which simplify the job of registering and counting votes. See BALLOT; VOTING MACHINE.

All the states and Canadian provinces allow servicemen who cannot go to their polling places during general elections to vote by *absentee ballot*. Election clerks send them ballots to be marked and returned by mail. All the provinces and all the states except Mississippi also grant absentee voting rights to civilians who must be away from their precincts during general elections. But South Carolina limits such rights to college students, and Alabama restricts the absentee vote to such groups as sick people, college students, and people at sea. Some Mississippi voters who must be away may vote early. See ABSENTEE VOTING.

Voting Behavior. Many eligible voters in the United States rarely—or never—vote. During the 1960's, about 65 per cent of the *electorate* (those eligible to vote) voted in presidential elections. In many other democracies, at least 80 per cent of the voters go to the polls in equivalent elections. Some nations prevent low election turnouts by fining or imprisoning citizens who do not vote.

In general, people vote if they believe they have something to gain or lose from an election. Social scientists have found that some groups of people vote more often than others. Men seem to vote more than women, and persons from 40 to 60 years old vote more frequently than younger or older people. The higher an individual's income or education, the more likely he is to vote. Family and social background also affects how people vote. For example, many people support the political party that their parents support.

Dramatic national or world events may cause major shifts in voting patterns. During the Great Depression of the 1930's, for example, party loyalties in the United States changed greatly. GEORGE W. CAREY

Related Articles in WORLD BOOK include:

Civil Rights
Colonial Life in America (Voting Requirements)
Congress of the United States (Passing a Bill)
Election
Logrolling
Parliamentary Procedure (Voting on Motions)
Plebiscite
United Nations (Meetings and Voting; Voting)

VOTING IN PRESIDENTIAL ELECTIONS. See ELECTORAL COLLEGE (color diagram); VOTING.

VOTING MACHINE is a mechanical device for recording and counting votes at an election. It provides an absolutely secret ballot and records it automatically, with total accuracy and with speed and economy. Over half of all U.S. voters cast ballots on voting machines.

Operation. Voting machines may differ in some details, but they all work in much the same way. The voter stands in front of the machine and moves a master lever to close a set of curtains around him and unlock the mechanism. Before him are the names of all the candidates, arranged in rows according to their political party. The candidates are listed next to the titles of the offices they seek. The voter turns a pointer next to the name of each candidate he chooses for an office. In some states, he may vote a *straight ticket* by pulling a *party lever* at one end of the party's row of candidates. The machine will then register a vote for each candidate in the row. The machine does not register or count any votes until the voter moves the master lever back. This registers and counts the vote, and opens the curtains.

Voting machines also provide for ballots on bond issues or other proposals. The machine registers a *yes* or *no* vote. Modern voting machines have one row of voting pointers for questions, and nine party rows of voting pointers for candidates. They are built in sizes to accommodate 270, 360, 450, or 540 candidates.

Advantages. A voting machine is both automatic and impartial. Dishonest officials cannot change it or tamper with its records, although they might "stuff" a ballot box with paper ballots. Fewer election officials are needed, and the cost of printing paper ballots is reduced. The machine also eliminates expensive and possibly inaccurate recounts of hand-counted paper ballots. The savings resulting within a few years often equals the machine's cost. The useful life of a voting machine is often as much as 50 years.

Legislative Voting Machines record the votes for and against proposals in many state legislatures. These electric and mechanical devices reduce the time needed for a roll-call vote of the legislators. Each lawmaker

A Voting Machine provides automatic recording and counting of election votes. The voter at the left has moved the pointers to indicate her choices. She is about to pull the large lever to the left. This action automatically records her vote, returns the pointers to their original positions, and opens the curtain of the voting booth.

Computer Election Systems, Inc.

has buttons on his desk with which he can vote either *yes* or *no*. When he presses the button of his choice, his vote appears on a counting device at the clerk's or speaker's desk. Many legislatures also have a counting board on one wall of the chamber. As each legislator casts his vote, he lights a colored light opposite his name on this board. Many legislative voting machines provide a permanent record, showing the total votes cast and the vote of each legislator on each roll-call.

History. Thomas Edison invented the first legislative voting machine in 1868 (see EDISON, THOMAS ALVA [Early Inventions]). Election voting machines developed more slowly. The first practical voting machine used in an actual election was put into service in Lockport, New York, in 1892. Manufacture and distribution of voting machines has continued steadily since that time. The machines are in use in more than three-fourths of the states. Many states now require the use of voting machines in all elections, including primaries.

The United States was the first country to conduct elections by machine. Several other countries began using voting machines in the 1960's. Still other countries are engaged in research on their use. R. E. HORROCKS

VOTING RIGHTS ACT OF 1965. See NEGRO (New Civil Rights Acts).

VOUSSOIR. See ARCH (diagram).

VOWEL. When a person opens his mouth and says "ah" for the doctor, he makes an open sound with free passage of breath. This sound is a vowel, as are all the other open and freely breathed sounds in speech. In English, the vowel sounds are represented by the letters, *a*, *e*, *i*, *o*, *u*, and sometimes *w* and *y* (as in *now*, *city*). But each letter stands for several sounds. The open quality of vowels distinguishes them from *consonants*. Consonants are formed with the organs of speech more or less closed. A vowel may be a syllable in itself, or it may be joined with one or more consonants to produce a syllable. See also CONSONANT; PRONUNCIATION. CLARENCE STRATTON

VOYAGEURS NATIONAL PARK, *VWAH yah ZHURZ*, lies in northern Minnesota at the United States-Canadian border. The early French-Canadian traders and frontiersmen known as *voyageurs* traveled the scenic waterways of the area. The park was created in 1971, but the federal government has not yet obtained all the necessary land rights. When completed, Voyageurs National Park will cover 219,431 acres (88,801 hectares), including about 80,000 acres (32,000 hectares) of lakes and streams. Waterways will be the main means of travel in the park. The major lakes include Kabetogama, Namakan, and Rainy. Bears, deer, timber wolves, wildfowl, and other animals live in the park. GEORGE B. HARTZOG, JR.

VOZNESENSKY, ANDREY. See RUSSIAN LITERATURE (The 1950's and 1960's).

VTOL AND V/STOL. See AIRPLANE (Aircraft of the Future; picture); CONVERTIPLANE.

VUCHETICH, YEVGENY. See SCULPTURE (As Monuments and Memorials; color picture).

VUILLARD, *vwee YAHR*, **EDOUARD** (1868-1940), was a French painter. His pictures portray his own private world—a view from a window, or corners of his studio and living room enclosed by walls and furniture.

In his interior scenes, Vuillard showed figures reading, relaxing, or concentrating on common tasks. He painted his environment both as a place of quiet and rest and as a disturbing situation where even the walls appear menacing. Like his friend and fellow artist Pierre Bonnard, Vuillard was influenced by Japanese art. This influence appears in the brilliantly colored flat patterns of Vuillard's paintings. See BONNARD, PIERRE.

Vuillard was born in Cuiseaux, near Chalon. He lived most of his life withdrawn from society. ALBERT BOIME

VULCAN, in Roman mythology, was the god of fire, metalworking, and skilled craftsmanship in general. He also served as the blacksmith of the gods. Vulcan produced armor, weapons, and many other works at his forge, all of them perfectly made. Some of his creations even had magic qualities.

Roman metalworkers and other craftsmen worshiped Vulcan as their patron. He closely resembled the Greek god Hephaestus. Many myths about Vulcan are identical with those about Hephaestus.

Vulcan was the son of Jupiter and Juno, the king and queen of the gods. One myth describes Vulcan as being the son of Juno alone, with no father. Vulcan was lame—the only major Roman god who was physically imperfect. Some myths say he was born lame, and others say he became lame from a fall.

Although Vulcan was the least attractive of the gods, he married Venus, the goddess of love and beauty. Venus was unfaithful to Vulcan with both gods and mortal men. Many myths tell of Vulcan's jealousy over his wife's love affairs.

Venus' affair with Anchises, a mortal, resulted in the birth of Aeneas, a Trojan hero. In the *Aeneid*, an epic by the Roman poet Virgil, Venus persuaded Vulcan to make a magic shield to protect her son in battle.

Because of his association with fire, Vulcan's name forms part of the word *vulcanization*, the name of an industrial process of treating rubber with heat. The English word *volcano* comes from the Italian form of Vulcan's name. PAUL PASCAL

See also HEPHAESTUS; VENUS; PANDORA.

VULCANIZATION. See RUBBER (Discovery of Vulcanization; Vulcanization); TIRE (How Tires Are Made).

VULGATE is the name of a Latin translation of the Bible. The word is Latin in origin and means *commonly received translation*. The Vulgate is a revision of the earlier, Old Latin versions of the Bible. It was completed in A.D. 405 by Saint Jerome.

By a decree of the Council of Trent the Vulgate translation was made the standard Bible of the Roman Catholic Church. Pope Sixtus V appointed scholars to revise the Vulgate in 1587, but after his death in 1590 many alleged errors were found in the work. Under Pope Clement VIII there were further revisions in 1592 and 1598. The last one became the official text for use in the Roman Catholic Church.

The Vulgate and the English versions of the Bible differ in the order of the books and the divisions of chapters. The Vulgate also contains certain books which Protestants consider part of the Apocrypha. The English translation of the Vulgate is called the Douai, or Douay, Bible, after the town of Douai, France, in which the Old Testament portion was first published.

In 1941 a new Catholic English version of the New Testament was published in the United States. Later, Pope Pius XII declared that scholars should now take account of the "original languages" (Hebrew and Greek) as well as the Latin, in interpreting the Scriptures.

A revision of the Vulgate was undertaken by Catholic scholars in 1908, and is now in progress. An important translation of the Bible from the Vulgate into the English language was published in three volumes, from 1944 to 1950. EDGAR J. GOODSPEED

See also BIBLE (How the Bible Developed).

VULTURE, *VUL tyoor*, is the name of several large birds of prey. They eat *carrion*, or dead animals. Other birds of prey have feathers on their heads, but vultures do not. They have slightly hooked bills and blunt claws which are poor weapons for seizing and carrying off their food. Vultures live in the temperate and tropical regions of America. The vultures of Europe and Asia look like American vultures and have similar habits. But their bodies are different. The Old World vultures belong to a different family, the hawk family.

Vultures are ugly birds, with their naked heads and dark feathers. They not only eat carrion, but they often vomit when they are disturbed. But they are useful, because they eat dead bodies which otherwise might decay and become dangerous to health. Generally, vultures do not carry disease.

Vultures have a graceful, easy, soaring flight. They sail in broad circles, high in the sky. They have sharp eyes and a keen sense of smell. They can see dead animals from great distances.

Vultures are usually seen in large, mixed flocks, except during breeding season. Then they pair off and nest on the ground under overhanging cliffs, in logs, and in caves. They build no nests. The female lays from 1 to 3 eggs on bare surfaces. The parents bring food in their throats and empty it into the young bird's mouth.

New World Vultures. There are six species of American vultures. Three live in North America. The turkey vulture, also called *buzzard* or *turkey buzzard*, is found from southern Canada to southern South America. It grows about 30 inches (76 centimeters) long.

The *black vulture* is about 6 inches (15 centimeters) shorter than the turkey vulture. It is found from the central United States to southern South America. This bird is entirely black except for white underwings.

The largest land bird in North America is the vulture called the *California condor*. It is 45 to 50 inches (114 to

Norman Myers

Egyptian Vultures use rocks to break open ostrich eggs. The bird hurls the rock from its beak with a snap of the neck.

130 centimeters) long and has a wingspread of 8 to 11 feet (2.4 to 3.4 meters).

The *king vulture* is the most striking of the three South American vultures. It has a feather ruff around its neck, and its head is yellow, scarlet, white, and blue, with fleshy growths of rich orange. Its bill is orange and black.

The *South American condor* is about as large as the California condor. It lives high in the Andes of Chile and Peru, and appears on the coats of arms of Bolivia, Chile, Colombia, and Ecuador. The *yellow-headed turkey vulture* of northern South America and Brazil resembles such North American vultures as the turkey buzzard.

Old World Vultures. There are 14 species of Old World vultures. The *cinereous vulture* grows to about 42 inches (107 centimeters) long. It has a bare, pinkish head and black feathers. The cinereous vulture is found in southern Europe, northwest Africa, and central Asia.

The *griffon vulture* is about the same size and appearance, and has about the same range. The *Egyptian*, or *white*, *vulture* is about 25 inches (64 centimeters) long with a naked yellow head and whitish feathers except for the black wings. It lives in the Mediterranean area, as far east as India.

Scientific Classification. New World vultures belong to the family *Cathartidae*. The turkey vulture is genus *Cathartes*, species *C. aura;* the black vulture is *Coragyps atratus;* and the California condor is *Gymnogyps californianus*. The king vulture is *Sarcoramphus papa;* the South American condor is *Vultur gryphus;* and the yellow-headed turkey vulture is *Cathartes urubitinga*. Old World vultures belong to the family *Accipitridae*. The cinereous vulture is *Aegypius monachus*, the griffon vulture is *Gyps fulvus*, the Egyptian is *Neophron percnopterus*, and the white-rumped is *Gyps africanus*.

OLIN SEWALL PETTINGILL, JR.

See also ANIMAL (color picture: Animals of the Grasslands); BUZZARD; CONDOR; LAMMERGEIER.

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